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THE CANCER PROBLEM: INCIDENCE AND IMPORTANCE.[1]

By A. LAWRENCE ABEL, M.S. (Lond.), F.R.C.S. (Eng.),

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IN order to answer the question whether there is in fact a cancer problem and, if so, what its scope is, we must look first at the incidence and hence the importance of this disease.

Cancer ranks second only to cardio-vascular diseases in being the great killing scourge of our time. It stays high because we are not instituting early treatment while the cancer is still local.

If we look at the Registrar-General's vital statistics for England and Wales, we see that in 1913 the population was 36,000,000 and by 1951 had risen to 44,000,000, an increase of 22%. The total deaths in 1913 were 505,000 and in 1951, 510,000—an increase of only 1%.

In 1913, 39,000 persons died of cancer. By 1951 this number had risen to 87,000—an increase of 125%.

In Australia in 1919, 4421 died of cancer, and this figure had risen by 1951 to 9065.

Just before the first World War one person in 13 died of cancer. The most recent figures of the Registrar-General show that today the proportion is 1 in 6. This increase cannot be fully explained by greater longevity or by more accurate diagnosis.

Expressed in another way, cancer kills 240 persons per day in England and Wales, which is 10 every hour or one every six minutes.

The subject is important to us both as individuals and as a nation. It is important to us as individuals because out of every 100 people alive today 16 will die of cancer. It is important to us as a nation because cancer strikes at the time of life when it is important for the victim, for his family and for the community that he should continue to live.

Life consists of three stages: (i) The stage of growth, which occupies about twenty years. (ii) The stage of accomplishment and of value to the national life, which lasts from the age of twenty up to the age of sixty-five, seventy or even eighty years or over. It is during the second half of this stage that cancer works its greatest devastation. (iii) The age of rest and relaxation and decline, which few of us will ever be able to afford or hope to indulge in.

If we are agreed that the problem is important, urgent and vital, it may be discussed under four headings: (i) How can early diagnosis be attained? (ii) How can research, both clinical and pathological, help? (iii) What

[1] A lecture delivered at the Stawell Hall, 145 Macquarie Street, Sydney, under the auspices of the Post-Graduate Committee in Medicine in the University of Sydney, on Thursday, August 12, 1954.

methods are available for treatment? (iv) How can the best treatment be made available for most patients?

EARLY DIAGNOSIS.

Before we discuss the factors upon which early diagnosis depends, let us pause for a moment to ask ourselves: Is early diagnosis worth while and does it make a difference to the patient? A single illustration of this may be given in reference to the treatment of cancer of the breast. Among patients operated upon early in the course of disease there was an 84% survival for ten years and over. Among patients with more advanced disease there was only a 29% survival, and among those with the most advanced only a 6% survival. This is true of cancer of many other organs. It is important, therefore, to diagnose the disease early.

The early diagnosis of malignant disease rests upon the following: (*a*) education of both the public and the medical profession on early symptoms; (*b*) recognition of the disease by both the family doctor and the cancer team, from the clinical case history and by examination of the patient.

Early diagnosis depends upon a knowledge of early symptoms and signs of the disease and on a full examination of the patient. This means a better education of two classes of the community — first, the lay public, and secondly, the whole medical profession—nurses, students, doctors and specialists.

It is often said that if one talks cancer it makes the people think cancer and they will be frightened to death. On the contrary, it should frighten them to live and to seek advice early.

Education of the public must be carried out by propaganda telling them to report at once any lump or swelling, any sore or ulcer, any abnormal bleeding or discharge, bowel irregularity or indigestion, and stressing that of the patients who report early many are cured, but if all patients reported early very many more would be cured.

Much good propaganda is carried out by medical officers of health, women's institutes and the like, the Propaganda Committee of the British Empire Cancer Campaign, and even a well-known "digest". In spite of what may be said about the few people developing cancerphobia, even that would be well worth while if even 50% of the 87,000 who now die annually from cancer could be cured by early diagnosis and early treatment.

It is surprising what a small number of patients seek medical advice while treatment is still possible. An inquiry into the extent to which patients received treatment was carried out by Dr. Sholto McKenzie and published by the Ministry of Health in 1939. This showed that out of 1147 patients with cancer, only 303 or 26% were treated. For one reason or another three out of four were untreated. The same worker analysed the histories of 312 patients who refused treatment, and found that in 67% of those who gave a reason, that reason was fear—fear of operation, or fear of examination, or fear of leaving home.

The same worker took another series of 3303 cancer patients and found that of these 2420 or 73% were untreated.

Delay in Treatment.

When and why does the delay in treatment occur? It occurs mainly between the first symptom and the first visit to the doctor. Approximately 80 out of every 100 patients disregard the first danger signals too long, either because they do not recognize them or because they do not think they are serious enough and want to carry on their livelihood as long as possible before giving in. They think they cannot have cancer because any serious disease must be painful, and they have no pain; whereas the truth is that cancer is painful only in its later and spreading stages.

The Causes of Delay.

The causes of delay are as follows.

Fear.—Many patients suffer from such an unreasoning fear of cancer that they do not seek advice even when they suspect that they have the disease. Ostrich-like, they bury their heads in the sand and simply refuse to face the truth. Instead of consulting a physician they try to ignore their symptoms, hoping that the underlying condition will disappear or will prove to be something harmless. At the same time a patient burdened with fear frequently assumes a fatalistic attitude towards the disease. He attempts to justify his hesitancy with the thought: "Well, if it is cancer, nothing can be done about it anyway." Only after symptoms become severe does he decide to consult a physician.

Ignorance.—Lack of knowledge concerning the nature and early symptoms of cancer is the most important reason for delay in seeking medical advice. Without such knowledge the patient readily ignores early danger signals which often appear trivial. Cancer begins insidiously and rarely gives rise to pain or other alarming symptoms until the disease is far advanced. Patients who are unfamiliar with the early signs of the disease often wait until pain or other distressing symptoms appear. By that time it is usually too late. Learn the danger signals. Arm yourself against this disease.

Gullibility.—Gullibility on the part of many cancer patients makes them easy prey for quacks. There are today over 5000 quack "cures" of various kinds. None of them have any curative value whatever. Yet thousands of patients continue to be lured by the false claims of charlatans. Hoping against hope for a miracle to make them well, they swallow worthless pills and rub on equally worthless salves. The gullible patient will try one fake "cure" after another, while his cancer progresses to an incurable stage. Only when he must finally face the fact that his condition is worse will he consult a reputable physician.

False Modesty.—False modesty is a factor which influences some cancer patients to let precious time go by. They shrink from the idea of a medical examination. Commonly associated with this attitude is a feeling that it is a disgrace to have cancer. Such patients hide their symptoms from their relatives and friends as long as possible. They feel that the presence of the disease is something shameful. Usually they fail to consult a physician until the disease is far advanced.

The Result.

Whatever the reason for the patient's delay, the end result is the same. By the time he seeks medical aid the most favourable period for treatment has passed. Delay on the part of the patient in seeking medical aid is directly responsible for a large proportion of the deaths from cancer which now occur annually.

Early cancer is curable in a large percentage of cases, provided treatment is administered. Tell your patient: "Do not let ignorance, fear, gullibility, or false modesty keep you from seeking medical advice immediately symptoms appear."

Patients should be encouraged to seek advice, therefore, by direct propaganda to the public, which can be organized only by doctors who have themselves been educated in the importance of early diagnosis. A definite, efficient and satisfactory cancer service must be organized. The public must be convinced that there is no disgrace in being examined or treated for cancer.

Education of the Profession.

So much for the public; what about ourselves? Early diagnosis depends upon a knowledge of the early symptoms and upon the recognition of early signs of the disease by nurses, students, doctors and specialists alike. All of us have the confidence of our patients, and a nurse or medical student is no less likely to be consulted about some abnormality than is a doctor or specialist. Preeminently there must be the education of the family doctor to suspect cancer more and more often on less and less evidence, because all cancers appear benign in early stages. But he must know more than early symptoms and signs; he must know that early treatment is essential; he must send the patient urgently to the cancer team and he is responsible if there is any delay in treatment.

Equally important is the recognition of the disease by the cancer team. A careful investigation of every case, together with frequent consultation between the surgeon, physician and radiologist, with aid from the pathologist and endocrinologist, is essential in order to plan the all-important first treatment.

The work of the team must be accompanied by and controlled by a careful follow-up of all cases.

Until the medical profession as a whole is prepared to treat cancer, or suspected cancer, with the urgency with which it treats acute intestinal obstruction or acute appendicitis, we are unlikely to make the public realize the serious view we take of this disease. For example, it has been shown that more than 10% of patients with cancer of the breast are under forty years of age, and that in many of these cases the diagnosis of innocent conditions is made until it is too late to effect a complete cure.

Why is early diagnosis delayed? Firstly, it may be faulty training of the student. Both the student nurse and the medical student see cancer early in their clinical work, and are amazed by its widely differing manifestations. In one case there may be vague ill health, in another a small lump, in another a foul and bloody discharge, and in another excruciating pain. The student learns little except the treatment of an established case, and less of the ultimate outcome of the cases seen. Only when the nurse or the doctor is qualified and goes out into practice does it dawn on him that there is so much to be desired with regard to both diagnosis and treatment. This is because the only definite physical signs of malignancy are fixity and metastases. The student may leave the training hospital with a definite picture of the final stages and a list of the innocent conditions which may simulate cancer. Is it any wonder that patients are reassured to give them confidence that there is no cancer?

The general practitioner often has little experience in accurate early diagnosis. In thirty years of practice he seldom sees more than 20 new cases of cancer of the breast, and 10 new cases of cancer of the rectum. He sees relatively few cases of cancer, and has little opportunity of improving his knowledge, so when he sees, for example, a lump in the breast with no fixity, no retraction of the nipple, and no palpable lymph nodes in the axilla, his training leads him to think that it is chronic mastitis or innocent growth.

It is often suggested that the text-books should be revised, and early rather than late symptoms and signs stressed.

The consultant sees more cases, but probably makes a wrong diagnosis in at least 10%.

In hospital administration and organization there is often delay in admission.

As McWhirter pointed out in 1943, 7000 patients with cancer of the breast die every year in England and Wales. (The number is now 8000.) If in all cases treatment was begun within one month of the appearance of the first symptom, the number would be about 1000.

Successful treatment therefore depends on early diagnosis.

The Help to be Given by Research.

The next question we ask is, "How can research help?".

Perhaps ultimate success will depend upon the results of research, of which there are two main varieties: (i) pathological research, which endeavours to find what is a cancer, and what is the cause of it; (ii) clinical research into newer and better methods of diagnosis and the results of all forms of treatment.

Pathological Research.

A cancer may be described as a mass of cells resembling those normally present in the body, but arranged atypically, which grows at the expense of the body, alters the function of the organ from which it arises, and if untreated eventually brings about the death of the patient. A normal cell, on the other hand, grows, but stops growing when further growth is not needed. In ordinary inflammation cell division occurs and masses of cells are formed, but this process is arrested when the process of repair is complete, whereas in cancer the growth is continuous, and the characteristic of the cancer cell is irresistible growth. Sampson Handley says that the cancer cell is the complete anarchist—it grows for itself alone.

Experimental research grapples with the many problems in the study of cancer causation. Little was known of many diseases until germs were discovered and experiments led to the detection of the many diseases produced by different germs. It is only in recent years that my colleague, Professor Kennaway, has produced cancer experimentally by chemical substances. Today, under the influence of the British Empire Cancer Campaign and the Imperial Cancer Research Fund, there are more than 20 centres in the United Kingdom and 10 throughout the Empire, and 50 independent workers. Thousands of chemical agents have been tested, and the problem of how these work in the living cell has been studied.

How does the normal cell become a cancer cell? Can the process be controlled, prevented or reversed? Does something combine with the normal cell, or does something destroy the body fluid which controls normal growth? Is the change produced by something in food or in the air—for example, smog? Is tobacco a factor in some cases? Is the change due to germs or viruses?

The size of a living cell is very minute, the size of a germ much smaller still; but even that is large compared with the size of a virus. If it is true that a million germs can sit on the head of a pin, a million viruses can sit on the head of a germ.

This work therefore demands specially trained pathologists, bacteriologists and technicians, who need ultra-centrifuges costing £3000 each, and ultra-microscopes. The ordinary microscope costs about £150; the ultra-microscope with 100 times the ordinary magnification costs £6000.

All this means the need for vast sums of money, and although germs and viruses are known to cause cancer in certain animals, there is as yet no proof that they cause human cancer.

It has recently been shown that some growths—for example, malignant hepatoma in rats—arise from a benign growth because of the absence of viruses.

Clinical Research.

Clinical research is progressing side by side with experimental pathological research. Clinical research means the study of the patient and his growth, studies at the bedside, on the operating table, and in the post-mortem room, studies of many different methods of treatment, the follow-up of many cases, and the passage of many years.

Many of us, nay all of us, would like to see the elucidation of this problem in our lifetime, and by experimental cancer upon animals and a properly organized cancer service this should be possible.

Clinical research continues on the effects of treatment by the 1,000,000 and 2,000,000 high-voltage X-ray therapy machines. The latest at the Royal Cancer Hospital is one of 22,000,000 volts.

Recently my physicist colleague Professor Mayneord has attached a television screen to an X-ray tube. This gives one thousand times normal illumination. No dark room is necessary, as illumination is bright enough for screening to take place in subdued daylight. A much smaller wattage is needed (one or two instead of the usual 200). Normally fluoroscopic screening can continue for only a matter of seconds for fear of producing an X-ray burn. With the new apparatus it may last half an hour without risk, and cinematograph pictures may be taken.

Clinical research has led to the introduction of safer anæsthetics, and bigger and more radical operations than ever before are now of daily occurrence, with mortality reduced to a minimum.

A careful "follow-up" and statistical department is essential if the end results of treatment are to be assessed and evaluated, and if we are to find the best possible method in all different types of cancer.

Clinical research is also investigating the effect of chemical substances in the treatment of the disease.

The most important contribution of chemotherapy in the treatment of cancer is the effect on cancer of the

prostate produced by synthetic œstrogens, as prepared by Professor Sir Charles Dodds of the Middlesex Hospital. Although these substances do not cure cancer of the prostate, their effect is often dramatic for a few years. They relieve many of the patient's symptoms, often stop his pain and prolong his expectation of life, often by several years. Sooner or later their control of the disease ceases. Even then a surgical functional orchidectomy is often of value. Clinicians are also taking advantage of the benefits which occur from the use of androgens in cancer of the breast, glands, bones and blood. As a result of these many more sufferers are improved and greater improvements are attained. The chemists hope that by changing the size of the molecules greater and greater improvements may follow.

Recently we have been working with radioactive isotopes of gold, iodine and phosphorus. These substances are activated by the atomic pile—a tame atom bomb—the modern version of "beating swords into ploughshares". Thanks to the generosity of Mr. McConnell, of Montreal, there has arrived in England a cobalt bomb, which gives us the equivalent of £1,000,000 worth of radium in the size of a ping-pong ball. The effect of radioactive cobalt in various types of growths is now being studied.

Other lines of research being undertaken are on cancer of the bladder and its relation to industry, on cancer and heredity, and on cancer in children.

It is, of course, essential to explore every avenue, for there are many puzzles still.

THE METHODS OF TREATMENT AVAILABLE.

Our next question is, what methods are available for treatment? A corollary to this is, how efficacious is the treatment in any particular case?

To answer the latter question it is important to have a yard-stick against which to measure the result of treatment. This means that it is essential to know the natural duration of any particular type of cancer. Let us consider for a moment the subject of cancer of the breast. A woman of fifty-five years who develops this disease, and in whom it is entirely untreated, must expect to live only an average of three and a quarter years, whereas the normal expectation of life for a normal woman of fifty-five years is twenty-two years. The average time at which such a patient comes for treatment is when the disease has been present for only one year. Operation alone, even at this comparatively later stage, nearly doubles her expectation of life, and this expectation may be further increased by the use of X rays and hormones. However, if this woman is operated upon under the best conditions—namely, while the disease is still localized to the breast, and the skin and the axillary and supraclavicular lymph nodes are not affected, her expectation of life is about four times as long as that of an untreated patient.

Consider the centuries it has taken to evolve the modern treatment for cancer of the breast. The Greeks and Romans saw it only when it was ulcerated and irremovable. It is doubtful whether they would have recognized it if they had seen it in an early stage, for this growth is easily hidden, as it is at the present day, and the victim often does not seek advice until hæmorrhage or ulceration and fœtid discharge occur. For centuries an affected woman has felt mutilated in body and mind, and it was this that placed St. Agatha amongst the noble army of martyrs.

Hippocrates (400 B.C.) advised against operation. Celsus (A.D. 50) advised that caustics should be applied first, and then the breast removed by cautery. Galen (A.D. 120 to A.D. 200) advised that the breast should be removed. Lorenz Heisters (1683 to 1753) said that if the lymphatic glands could be felt, operation would do no good. Sir James Paget regarded the operation as very severe. Robert Liston, during the first half of the last century, said that no one could be found so rash or cruel as to attempt removal of glands. Charles Moore, in 1867, concluded that the failures of treatment were due to an incomplete operation, and emphasized that it was necessary to avoid cutting into the tumour and to remove the lymphatic glands at the same time. Joseph Lister (1827 to 1912) also urged the removal of lymphatic glands, even though they were unaffected clinically. William Stewart Halstead described the operation still known by his name in 1898.

Some patients appear to be better treated by having a course of X-ray treatment before operation, others by having no X-ray treatment at all but only the Halstead operation, others again by having the Halstead operation followed by X-ray treatment, and again others by having a local amputation of the breast with X-ray treatment to several glandular areas, while some are best treated by X-ray therapy alone. For several years now also the work of the endocrinologist has been applied to all stages and types of cancer of the breast, in the hope that hormones will have some effect, as indeed they occasionally appear to do, in delaying the progress of the disease.

In many pre-menopausal cases, total oophorectomy appears of great value as an adjunct to other methods. Surgical oophorectomy appears to give better results than attempts to destroy the ovaries by X-ray or radium therapy, or by large doses of androgens.

Consider briefly the modern treatment for cancer of the rectum. Another worker, who by his own individual efforts evolved the basis of all modern operations for cancer of the rectum, was my old friend, chief and colleague, William Ernest Miles, whose operation since 1907 has remained the standard procedure for cancer of the rectum. This operation produces, in cases without obvious spread, approximately 70% of complete cures.

THE AVAILABILITY OF TREATMENT.

Lastly we have asked how can the best treatment be made available for the greatest number of patients. In order to answer this let us look at the main factors which contribute to failure in treatment:

1. The treatment is not given sufficiently early in the disease: (a) Early diagnosis is not attained. (b) There is delay in commencing the treatment.

2. The treatment given is not always adequate. Never forget that the first treatment is the all-important one.

3. Sufficient use is not made of past experience. Experience is not pooled as it should be, and as it would be if we had a central and regional organization with cooperating centres. Treatment should be organized on a consultative plan by regular discussion of cases and results.

The type of case suitable for a particular method or methods of treatment, and the types of treatment likely to bring the utmost benefit to a particular patient can be learned only by what is called "clinical cancer research".

Every patient with cancer, wherever and by whom treated, must be the subject of most careful clinical research from the first appearance of symptoms until the day he dies. What a callous, cold-blooded thing it sounds to say that every patient must be the subject of research! Nevertheless this is essential, and to carry this out a team of workers is necessary.

Teamwork must be unobtrusive, and not slavishly or obviously employed. The keystone of the team is the clinician, with plenty of the milk of human kindness, human understanding and sympathy, and a wide knowledge of what can be achieved by all methods of modern treatment. Few patients want to be treated by a team; each wants his own personal specialist or doctor, in whom he has complete confidence, from whom he learns the answers to his many and difficult questions, and who advises him as a guide, counsellor and friend, as to the best course of treatment in his particular case. This clinician should call in the other members of the team as and when necessary, and the patient will never realize that he is being treated by a team. This system has worked well for several years at the Royal Cancer Hospital; but no member of the team feels that his personal responsibility is any less, nor does any patient, I hope and believe, feel that he is treated impersonally, or that he has no real friend whose full energies are directed solely towards getting him well.

The clinician is a surgeon or physician according to the type of case, with a wide knowledge, not only of his own subject, but also of what can and what cannot be achieved

by other colleagues, and of the interpretation of pathological findings. Another member of the team is the radiotherapist, not only trained for many years in his own speciality, but also with a high standard of general clinical competence. Working in close collaboration with him is the physicist, without whose laboratory and skilful assistance the biological effects of irradiation would not have been learned, and could not be controlled. A fourth member of the team is the pathologist, from whom we learn the microscopical details of the cancer cells we endeavour to eradicate.

The main functions of such a team should be: (i) to secure adequate treatment at an early stage; (ii) to assess results obtained from different treatments; (iii) to plan and direct future treatment from past experience.

What does the team need so that it may function to the utmost advantage? In the first place, it needs a proper diagnostic centre, so that any patient suspected of having cancer or allied disease can have a careful and thorough examination by all modern methods; the centre will be easily accessible to his home, and in it at least one private consulting room is available where a private talk, which sooner or later always becomes advisable, may be had with every patient, away from the hurly-burly of an ordinary out-patient department. A consultation between the members of the team should be not only possible but invariable, and the patient's private doctor should be kept closely in touch.

It has been suggested that the team should work as part of a plan for a regional cancer service. There are many today who maintain that the treatment of cancer is not a special subject, but only a small branch of general surgery. I am one of those who disagree with this, because I believe that the whole cancer problem has become so complex and is so serious a matter for the whole nation that this greatest of all killing surgical diseases demands our special urgent and most thorough investigation and treatment.

The cancer team not only investigates the history of the patient, examines him and arranges for and carries out his treatment, and sees him through convalescence and back to work, but follows him up as long as he lives. A careful "follow-up" means that as time passes the results of treatment are known and every possible use is made of past experience.

In 1938, the British Empire Cancer Campaign started through its Clinical Cancer Research Committee a vast attempt to ensure that all experiences with cancer patients in London should be recorded, and in fact for nearly two years every known fact about each cancer patient was carefully recorded on a special case sheet. Had it not been for the war, this enormous and valuable experiment, inaugurated largely thanks to the energy of Lord Horder and Dr. Malcolm Donaldson, would have spread to the whole country, and soon we hoped to the whole Empire. Many valuable and hitherto unknown facts have been discovered; but this investigation has not been continued.

The cancer team should work in close cooperation with a regional and through that a national organization. This organization should ensure that adequate treatment is available at the earliest possible stage. The results obtained from different treatments should be assessed and evaluated. A treatment would be organized at a consultative plane by regular discussion of cases and results, and the future methods of attack regulated by past experiences. Some such regional headquarter centre is needed for every two million of our population, with subsidiary centres cooperating with it at reasonable distances around.

The cancer team does, of course, need much in the way of technical and clerical assistance. Each member can do much to look beyond his immediate treatment problems, to seek causes, to help to achieve earlier diagnosis, to see that adequate facilities for treatment are available for all, to tell the public that cancer is a curable disease, as I have tried to tell you today, and to impress on every student, every practitioner, every nurse, and specialist the need to ask himself every time he sees a patient: "Can these signs and symptoms be due to cancer? And if so, may there not still be time for cure if I do not delay?" Why is it that some of the most advanced cancers of the breast that we see occur in nurses? Surely they should know what can be done with early diagnosis and early treatment. Surely the time for ineptitude and sloth has passed, and we must harass the government committees to give us new ultramicroscopes, cyclotrons, betatrons, synchrotrons, new and better operation theatres and laboratory equipment, easier facilities for patients to travel to treatment centres, and better facilities for the treatment of patients in their own homes; and we must keep constantly before them the heavy responsibility they bear, having concentrated so much treatment in their own hands.

We welcome government assistance, but we must also see that the patient's interests are preserved, for they have always been in our keeping. Nevertheless it is part of our business to see that government departments supply the facilities that are essential for our patient's welfare.

Neither a Ministry of Health, nor lay officials, nor even their administrative medical advisers, can take from the clinicians the responsibility which is ours. That responsibility affects the lives of one in every six of our fellow countrymen today, and we must see to it that a new day shall break, and the shadow of cancer shall flee away.

Conclusion.

It is true that there are many puzzles still; but research workers throughout the world are working to a great build-up. Recently, my friend and colleague Professor Haddow, of the Institute of Cancer Research (Royal Cancer Hospital), made the following statement:

> While much remains to be done I would hazard the prediction that sooner or later, depending on our efforts, we shall see in the treatment of cancer something entirely new, namely a kind of therapy by which the cancer cell will be controlled from without, by the same kind of chemical means in virtue of which the normal cell automatically regulates itself from within. While we cannot penetrate the future, the prospects have sensibly changed, and even cancer prevention, which only a few years ago semed utterly beyond our hopes, may yet prove to be within our ultimate powers.

I think if someone like Abraham Lincoln were here tonight he might use words similar to those he used at Gettysburg: "It is for us to be here dedicated to the great task before us that we here highly resolve that this nation under God shall have a new birth of freedom and that freedom—freedom from the fear and curse of cancer—freedom of the people, by the people, for the people, shall not perish from the earth."

STUDIES ON SOME CLINICAL FEATURES OF POLIOMYELITIS: II. INTERRELATIONS BETWEEN THE CLINICAL FEATURES OF POLIOMYELITIS, WITH COMMENTS ON VOMITING, PORTAL OF ENTRY AND PATHOGENESIS.

By R. V. Southcott,
Adelaide.

Association Between the Encephalitic and Bulbar Forms of Poliomyelitis.

It is proposed to examine here the relationships (if any) between the incidences of encephalitic, bulbar and spinal forms of poliomyelitis, as they occurred in the South Australian epidemic of 1947-1948. As has been stated earlier (Southcott and Crosby, 1949; Southcott, 1953), each poliomyelitis patient was recorded as having encephalitic, bulbar or spinal manifestations on certain standard criteria, which were given. In the paralytic cases any one or more of these manifestations could be present. It is apparent that it is possible to have eight groups, depending on the presence or absence of each of these manifestations. The group in which all manifestations are absent will not, of course, come within the category of paralytic poliomyelitis. The paralytic cases, divided into the seven groups

as above, are set out in Table I, and the incidences of each group, divided into rural and urban,[2] are shown.

TABLE I.

Incidence of Encephalitic, Bulbar and Spinal Manifestations in the 103 Paralytic Cases in the 1947–1948 South Australian Poliomyelitis Epidemic, Divided into Urban and Rural.

TABLE Ia.

Group.	Manifestation.			Rural.	Urban.	Totals.
	Encephalitic.	Bulbar.	Spinal.			
A	–[1]	–	+[1]	27	32	59
B	–	+	+	7	11	18
C	+	+	+	8	6	14
D	+	+	–	0	3	3
E	+	–	–	0	1	1
F	+	–	+	2	1	3
G	–	+	–	4	1	5
	Total ..	..	.. ..	48	55	103

[1] "+" signifies present; "–" absent.

TABLE Ib.

Manifestation Present or Absent.	Urban or Rural Case.	Type of Manifestation.		
		Encephalitic.	Bulbar.	Spinal.
Present	Urban	11 } 21	21 } 40	50 } 94
	Rural	10 }	19 }	44 }
Absent	Urban	44 } 82	34 } 63	5 } 9
	Rural	38 }	29 }	4 }
Totals ..	Urban ..	55 } 103	55 } 103	55 } 103
	Rural ..	48 }	48 }	48 }

Testing the data in Table I for homogeneity between urban and rural cases for the incidences of encephalitic, bulbar and spinal manifestations, we have the findings shown in Table II.

TABLE II.

Type of Manifestation.	Urban Cases.	Rural Cases.	χ^2 on One Degree of Freedom.	*P*.
Encephalitic	11/55	10/48	0·011	Not significant.
Bulbar ..	21/55	19/48	0·021	Not significant.
Spinal ..	50/55	44/48	0·018	Not significant.

We have therefore not found any lack of homogeneity in these proportions.

Now testing further the homogeneity of the proportions shown, for the groups A to G specified, between urban and rural cases, we have, after amalgamating where necessary, the following findings:

TABLE III.

Group.	Rural.	Urban.	Totals.
A	27	32	59
B	7	11	18
C	8	6	14
D to G	6	6	12
Totals	48	55	103

$\chi^2 = 1{\cdot}128$ on three degrees of freedom, which is not significant.

[2] Here used synonymously with extrametropolitan and metropolitan, as in previous studies.

We have therefore not been able to demonstrate any lack of homogeneity in the proportions tested, between the clinical subgroups of paralytic poliomyelitis.

We may test from the $2 \times 2 \times 2$ contingency table depending on the presence or absence of encephalitic, bulbar or spinal manifestations, as in Table IV.

TABLE IV.

Encephalitic Manifestations.	Bulbar Manifestations.		Totals.
	Present.	Absent.	
Present	17	4	21
Absent	23	59	82
Total ..	40	63	103

Performing an exact test, we find that $P = 0{\cdot}0000209$***.

Testing similarly for bulbar and spinal manifestations, we find the results shown in Table V.

TABLE V.

Spinal Manifestations.	Bulbar Manifestations.		Total.
	Present.	Absent.	
Present	32	62	94
Absent	8	1	9
Total ..	40	63	103

With an exact test, $P = 0{\cdot}00204$**.

Testing similarly for encephalitic and spinal manifestations, we get the results shown in Table VI.

TABLE VI.

Spinal Manifestations.	Encephalitic Manifestations.		Total.
	Present.	Absent.	
Present	17	4	21
Absent	77	5	82
Total ..	94	9	103

With an exact test, $P = 0{\cdot}0813$, which is not significant.

It has therefore been shown that there is a highly significant association between the presence of bulbar and encephalitic manifestations.

The concurrence of encephalitic and bulbar manifestations in poliomyelitis has been noted previously. Thus Strümpell (1884) stated that polioencephalitis was a form of bulbar poliomyelitis (quoted in Baker, Matzke and Brown, 1950). In their discussion on the "diffuse encephalitic group" of poliomyelitis, Brown, Baker, Adams and McQuarrie (1947) made the following statement:

> Although many patients with bulbar poliomyelitis showed the clinical symptomatology indicative of cerebral involvement, only a small number actually had inflammatory changes within the cerebral hemispheres. However, it was noticed that the cerebral symptoms would frequently disappear after measures were taken to insure adequate oxygenation of the patient. This was accomplished by tracheotomy, suction or oxygen under positive pressure by mask or tracheotomy. This led to the conclusion that many of the cerebral symptoms seen

in bulbar poliomyelitis were secondary to cerebral anoxia rather than to direct involvement of the brain by the virus.

However, these authors then quote a case with "encephalitic" manifestations and diplopia unrelieved by oxygen. They then proceed to discuss the "focal encephalitic group", and comment:

> It seems probable that the focal signs are due to actual inflammatory involvement of the implicated structure.

Aphasic disorders (including visual verbal agnosia) and cerebral motor phenomena are mentioned, including the case of one patient with repeated convulsions and eventual death from central respiratory failure. (This case was possibly similar to case NTBP 1, described earlier (Southcott, 1954), with repeated convulsions and oculogyric spasms, ascribed to cortical degeneration following polioencephalitis, with death ninety-two days after the earliest prodromal date.) These authors conclude as follows:

> Clinical symptomatology indicative of cerebral involvement is common in bulbar poliomyelitis. These symptoms usually are caused by anoxia and clear up after adequate oxygen therapy.

Bodian (1949) similarly reaches the following conclusion:

> "Encephalitic" symptoms such as drowsiness, restlessness, disorientation and coma occurred in those of our cases which had the severest inflammatory reaction in the brain stem. Small softenings often occur in these cases, but they show no unusual involvement of the cerebral cortex.

The present study has demonstrated that the association between the bulbar and encephalitic manifestations is sound statistically. As has been stated earlier (Southcott and Crosby, 1949), in assessing the various clinical categories an effort was made to exclude from the "encephalitic" category those cases in which the manifestations could be considered due to respiratory failure. We may agree that encephalitic manifestations in poliomyelitis are frequently an indication of hypoxia of the central nervous system. From some points of view, however, it appears unfortunate that Baker and his colleagues prefer to extend the term "bulbar poliomyelitis" to signify what could more properly be called "brainstem poliomyelitis". Thus Baker (1949*a*) admits:

> For the sake of simplicity in terminology, the word "bulbar" is used with some degree of license to denote involvement of the entire brain stem, including the medulla, pons and midbrain.

In an earlier paper, Brown, Baker, Adams and McQuarrie (1947) make the following statement in the discussion on their "upper cranial nerve nuclei group of bulbar poliomyelitis"—that is, the group with "involvement of fifth, sixth, seventh and eighth cranial nerves as well as the ocular nerves":

> For convenience all the various ocular manifestations of bulbar poliomyelitis have been placed in this group, although some of these manifestations are not related directly to the oculomotor nuclei.

There appears very little point in extending the term "bulbar" to include manifestations due to lesions of the mid-brain and beyond. Such a system of lumping divergent phenomena in one category only confuses the relationships whose ætiological connexion was not clearly demonstrated.

Association Between Bulbar Poliomyelitis and Oculomotor Lesions.

It is proposed to examine the incidence of oculomotor lesions in the bulbar and non-bulbar forms of paralytic poliomyelitis. This incidence for South Australia in the 1947-1948 epidemic is given in Table VII.

If the proportions shown in Table VII are tested for homogeneity, with an exact test $P = 0{\cdot}0120$*. It may therefore be concluded that there is statistical evidence of an association between bulbar poliomyelitis (this term being used in a restricted sense) and oculomotor lesions among the paralytic forms of poliomyelitis. Since the presence of an oculomotor lesion was accepted as one of the criteria for the presence of encephalitic manifestations, the relationship indicated above could account for part of the association demonstrated earlier between encephalitic and bulbar manifestations. The association just demonstrated between oculomotor lesions and bulbar manifestations could be used to justify the viewpoint that "brainstem poliomyelitis" comprises an ætiological group, which is virtually what Baker and his colleagues have shown, under the name of "bulbar poliomyelitis".

Table VII.

Incidence of Oculomotor Lesions in Bulbar and Non-Bulbar Paralytic Poliomyelitis for South Australia, 1947–1948.

Type of Poliomyelitis.	Oculomotor Lesion.		Total.
	Present.	Absent.	
Bulbar	6	33	39
Non-bulbar ..	1	62	63
Total ..	7	95	102

Analysis of Incidence of Symptoms within Various Clinical Subgroups of Poliomyelitis.

In 1949 the writer and N. D. Crosby published a table (Table III) of the analysis of symptom incidence of the 1947-1948 South Australian poliomyelitis cases. The analysis was made for the purposes of epidemiological study, and apart from some minor exceptions, showed a high degree of homogeneity among the incidences of symptoms between the various fractions studied—paralytics and non-paralytics, rural and urban cases, and first and second halves of the series. In the present paper these analyses have been carried further. In Table VIII the symptom incidences of various clinical sub-groups of poliomyelitis are given, divided by rural and urban classes. The denominator of each fraction of symptom incidence given indicates the total number of cases for which the presence or absence of that symptom was known. Although in some cases there is a considerable number of "not knowns", yet it appears a legitimate procedure to carry out the subsequent significance tests on the proportions observed. This statement is made in view of the high degree of homogeneity seen in the proportions tested earlier.

Testing of the proportions shown in Table VIII for homogeneity between rural and urban cases in each set of figures, by appropriate tests, shows no lack of homogeneity (at the 0·05 level of probability) between rural and urban. These figures may therefore be combined as is done in Table VIII.

By inspection of Table VIII certain clinical sub-groups appear to be non-homogeneous in the proportion of incidence of certain symptoms. Those proportions that appear worthy of being tested appropriately for lack of homogeneity are set out in Table IX, together with the results of the significance tests.

In testing for homogeneity a large body of data such as that shown in Table VIII, it may be expected that about one test in 20 will, by chance alone, show a lack of homogeneity at the 0·05 level of probability. We shall therefore take the 0·01 level of probability as indicating significance. In the case of the symptom "fever", apart from the foregoing considerations, any discrepancies found are explicable in terms of lack of standardization of observational technique between the paralytic and non-paralytic classes (see Southcott and Crosby, 1949). Differences in the proportions resulting in death within the various clinical sub-groups of poliomyelitis are significant at a high level of probability, as shown in Table IX. There is a high proportion of death in the encephalitic group and in the bulbar group. The significance tests shown in respect to death in Table IX are an indication of the mutual associations between encephalitic poliomyelitis, bulbar poliomyelitis, and death (see earlier in the present article, and also Southcott, 1953). Other significant differences revealed in Table IX are in respect to the symptom vomiting, and will be dealt with in the next section.

TABLE VIII.

Analysis of Symptom Incidence of Poliomyelitis in South Australia, 1947–1948, Subdivided into Clinical Sub-Groups by Rural and Urban.

Type of Poliomyelitis and Source.[1]	Clinical Types.			Incidence of Symptoms.											
	Encephalitic.	Bulbar.	Spinal.	Headache.	Fever.	Sore Throat.	Stiff Neck.	Cough.	Back Pain.	Lassitude.	Nausea.	Vomiting.	Abdominal Pain.	Diarrhœa.	Fatality.
Bulbar rural	8/19	19/19	15/19	13/15	17/17	5/13	13/17	0/10	10/14	13/14	11/14	13/16	3/11	1/13	6/19
Bulbar urban	9/21	21/21	17/21	16/20	21/21	8/18	18/21	4/16	10/16	18/19	14/16	17/20	4/13	1/18	10/21
All bulbar	17/40	40/40	32/40	29/35	38/38	13/31	31/38	4/26	20/30	31/33	25/30	30/36	7/24	2/31	16/40
Encephalitic rural	10/10	8/10	10/10	7/8	9/9	4/8	6/10	0/7	5/7	6/7	4/7	7/9	1/7	1/7	3/10
Encephalitic urban	11/11	9/11	7/11	8/11	11/11	5/10	8/11	2/9	4/9	9/10	9/10	9/11	4/8	1/9	7/11
All encephalitic	21/21	17/21	17/21	15/19	20/20	9/18	17/21	2/16	9/16	15/17	13/17	16/20	5/15	2/16	10/21
Non-bulbar paralytic poliomyelitis Rural	2/29	0/29	29/29	22/25	25/26	6/20	22/26	2/18	22/26	19/21	11/21	11/25	6/18	0/22	2/29
Urban	2/34	0/34	33/34	20/25	32/32	9/22	23/29	4/20	22/28	27/28	14/20	13/27	9/19	3/26	2/34
All non-bulbar paralytic poliomyelitis	4/63	0/63	62/63	42/48	57/58	15/42	45/55	6/38	44/54	46/49	25/41	24/52	15/37	3/48	4/63
Encephalitic Bulbar Spinal															
+ – – Rural	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
+ – – Urban	1/1	0/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
+ – – All	1/1	0/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1
– – + Rural	0/27	0/27	27/27	20/23	23/24	5/18	20/24	2/16	21/24	17/19	11/20	10/23	6/16	0/20	2/27
– – + Urban	0/32	0/32	32/32	18/21	30/30	8/20	21/27	3/19	20/26	26/27	12/18	11/26	7/17	2/25	2/32
– – + All	0/59	0/59	59/59	38/44	53/54	13/38	41/51	5/35	41/50	43/46	23/38	21/49	13/33	2/45	4/59
+ + + Rural	8/8	8/8	8/8	5/6	7/7	3/6	6/8	0/5	4/5	4/5	4/6	6/7	1/5	1/5	3/8
+ + + Urban	6/6	6/6	6/6	4/6	6/6	3/5	4/6	0/5	1/5	6/6	5/6	5/6	1/5	0/5	5/6
+ + + All	14/14	14/14	14/14	9/12	13/13	6/11	10/14	0/10	5/10	10/11	9/12	11/13	2/10	1/10	8/14
– + + Rural	0/7	7/7	7/7	5/6	6/6	1/5	6/7	0/4	4/6	7/7	6/6	5/6	2/5	0/6	1/7
– + + Urban	0/11	11/11	11/11	9/10	11/11	4/8	11/11	3/7	7/8	9/9	6/7	9/10	2/6	1/9	4/11
– + + All	0/18	18/18	18/18	14/16	17/17	5/13	17/18	3/11	11/14	16/16	12/13	14/16	4/11	1/15	5/18
+ + – Rural	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
+ + – Urban	3/3	3/3	0/3	2/3	3/3	1/3	3/3	1/3	1/2	2/3	2/2	2/3	1/1	0/3	2/3
+ + – All	3/3	3/3	0/3	2/3	3/3	1/3	3/3	1/3	1/2	2/3	2/2	2/3	1/1	0/3	2/3
+ – + Rural	2/2	0/2	2/2	2/2	2/2	1/2	2/2	0/2	1/2	2/2	0/1	1/2	0/2	0/2	0/2
+ – + Urban	1/1	0/1	1/1	1/1	1/1	1/1	1/1	0/0	1/1	0/0	1/1	1/1	1/1	0/0	0/1
+ – + All	3/3	0/3	3/3	3/3	3/3	2/3	3/3	0/2	2/3	2/2	1/2	2/3	1/3	0/2	0/3
– + – Rural	0/4	4/4	0/4	3/3	4/4	1/2	1/2	0/1	2/3	2/2	1/2	2/3	0/1	0/2	2/4
– + – Urban	0/1	1/1	0/1	1/1	1/1	0/1	1/1	0/1	1/1	1/1	1/1	1/1	0/1	0/1	0/1
– + – All	0/5	5/5	0/5	4/4	5/5	1/3	2/3	0/2	3/4	3/3	2/3	3/4	0/2	0/3	2/5
All paralytic: Rural	10/48	19/48	44/48	35/40	42/43	11/33	35/43	2/28	32/40	32/35	22/35	24/41	9/29	1/35	8/48
Urban	11/55	21/55	50/55	36/43	53/53	17/40	41/50	8/36	32/44	45/47	28/36	30/47	13/32	4/44	12/55
All	21/103	40/103	94/103	71/83	95/96	28/73	76/93	10/64	64/84	77/82	50/71	54/88	22/61	5/79	20/103
Non-paralytic: Rural	0/30	0/30	0/30	14/19	13/16	6/18	12/19	2/12	8/14	11/14	11/14	15/21	3/9	2/16	0/30
Urban	0/30	0/30	0/30	22/23	19/21	12/18	14/17	2/13	11/16	20/20	14/18	15/25	4/13	0/15	0/30
All	0/60	0/60	0/60	36/42	32/37	18/36	26/36	4/25	19/30	31/34	25/32	30/46	7/22	2/31	0/60
Grand total: rural and urban				107/125 (85·6%)	127/133 (95·5%)	46/109 (42·2%)	102/129 (79·1%)	14/89 (15·7%)	83/114 (72·8%)	108/116 (93·1%)	75/103 (72·8%)	84/132 (63·6%)	29/83 (34·9%)	7/110 (6·4%)	—

[1] "+" indicates presence, "–" absence; hence "+ – –" indicates cases with encephalitic but without bulbar or spinal manifestations.

TABLE IX.

Tests for Homogeneity of Proportions of Incidence of Symptoms and Outcome Between Various Clinical Sub-Groups of Poliomyelitis, South Australia, 1947–1948.

Groups Compared.	Symptom or Outcome.	Proportions Tested.		χ^2 on One Degree of Freedom.	*P*.
Encephalitic: spinal	Sore throat	9/18	13/38	0·701	Not significant
	Back pain	9/16	41/50	3·086	Not significant
	Vomiting	16/20	21/49	Exact *P*	0·0073**
	Death	10/21	4/59	Exact *P*	0·000114***
Encephalitic: non-paralytic poliomyelitis.	Stiff neck	17/21	26/36	Exact *P*	0·5366 Not significant
Bulbar: non-bulbar paralytic poliomyelitis.	Nausea	25/30	25/41	3·153	Not significant
	Vomiting	30/36	24/52	10·884	<0·001***
	Abdominal pain	7/24	15/37	0·398	Not significant
Bulbar: spinal	Sore throat	13/31	13/38	0·167	Not significant
	Back pain	20/30	41/50	1·661	Not significant
	Nausea	25/30	23/38	3·174	Not significant
	Vomiting	30/36	21/49	12·530	<0·001***
	Abdominal pain	7/24	13/33	0·268	Not significant
	Death	16/40	4/59	Exact *P*	0·0000804***
Bulbar: non-paralytic	Fever	38/38	32/37	Exact *P*	0·0253*
	Stiff neck	31/38	26/36	0·462	Not significant
	Nausea	25/30	25/32	0·039	Not significant
	Vomiting	30/36	30/46	2·516	Not significant
	Death	16/40	0/60	Exact *P*	$4·67 \times 10^{-6}$***
Spinal: non-paralytic	Fever	53/54	32/37	Exact *P*	0·0388*
	Sore throat	13/38	18/36	1·300	Not significant
	Stiff neck	41/51	26/36	0·401	Not significant
	Back pain	41/50	19/30	2·560	Not significant
	Nausea	23/38	25/32	1·747	Not significant
	Vomiting	21/49	30/46	3·914	<0·05*
	Abdominal pain	13/33	7/22	0·0821	Not significant

The Incidence of Vomiting in the Various Clinical Subgroups of Poliomyelitis.

From Table IX it can be seen that there is a significantly higher proportion of vomiting in the bulbar cases of poliomyelitis than in the spinal, at the 0·001 level of probability; and in the encephalitic cases than in the spinal cases, at the 0·01 level of probability. In view of the association demonstrated earlier between the bulbar and "encephalitic" (including oculomotor lesions) forms of poliomyelitis, it is proposed to consider this association with the bulbar cases only.

What is the patho-physiological significance of the increased incidence of vomiting in the bulbar form of poliomyelitis? By analogy with the interference with the respiratory and circulatory centres seen in bulbar poliomyelitis it could be inferred that the vomiting centre in the medulla is subject to similar involvement. Baker *et alii* (1950) have demonstrated definitive respiratory and circulatory centres in the human medulla from a correlation of clinical and pathological studies in bulbar poliomyelitis. Wang and Borison (1950, 1951) have shown, by stimulation and ablation experiments in various animals, that the vomiting centre lies in the dorsolateral part of the medullary reticular formation, including the *tractus solitarius* and its nucleus. Hatcher and Weiss (1923) and Hatcher (1924) had earlier postulated, from stimulation experiments with apomorphine in animals, that the vomiting centre lies in the dorsal nucleus of the vagus. However, Wang and Borison have shown that the dorsal nucleus of the vagus is only an afferent station on which the central emetic, apomorphine, acts. The existence of a vomiting centre was postulated as long ago as 1865 by Giannuzzi. Wang and Borison point out that the vomiting centre is not a "true" centre, in that it controls only vomiting. This area of the medulla is, in the experimental animal, in the midst of loci controlling functions intimately concerned with vomiting, such as salivation and spasmodic respiratory movements. The location of the vomiting centre in the medulla is, as given by Wang and Borison, close to that given for the respiratory centre as determined by Baker *et alii* (1950).

It might be thought that if there was interference with the vomiting centre, then one could expect a lower incidence of vomiting in the bulbar forms of poliomyelitis than in the non-bulbar, rather than higher. However, reference to the interference that occurs in the respiratory and circulatory functions in bulbar poliomyelitis would appear to indicate that the initial lesion stimulates rather than depresses these centres, as shown by the increase in the respiratory and circulatory rates. By analogy, then, the increase in the incidence of vomiting in bulbar cases is explicable. It does not appear probable that the same mechanism can account for the vomiting seen in the non-bulbar paralytic and the non-paralytic cases. Although Bodian (1949) has suggested that "it is also possible that the symptoms nausea and vomiting (in poliomyelitis) are due to damage to the vestibular centres", I do not favour this explanation, as one might reasonably expect to find commonly other evidence of vestibular involvement. I think it more likely that the nausea and vomiting which occur in non-bulbar paralytic poliomyelitis and non-paralytic poliomyelitis are due to "local" causes affecting the gastro-intestinal tract. Some of the same symptoms in bulbar poliomyelitis are also explicable on the same basis.

It has not been possible to show any significant differences between the incidence of abdominal pain in bulbar and that in other forms of poliomyelitis. Possibly abdominal pain in poliomyelitis is due to local causes in the intestinal tract. This explanation would fit with the explanation offered above of nausea and vomiting.

It may be concluded that in bulbar poliomyelitis the vomiting centre is interfered with.

It will be noticed that the incidence of vomiting in the various clinical forms of poliomyelitis in South Australia for the period 1947-1948 was as follows: (i) bulbar poliomyelitis, 30 out of 36, or 83·3%; (ii) non-paralytic poliomyelitis, 30 out of 46, or 65·2%; (iii) spinal poliomyelitis, 21 out of 49, or 42·9%. It may be asked why the proportion of vomiting is higher in non-paralytic than in spinal poliomyelitis. A possible explanation is as follows. In the spinal cases we do not depend so much on the incidence of systemic symptoms to make a diagnosis, and the presence of some paralysis or paresis is the dominating factor in diagnosis. In the non-paralytic cases we depend on the presence of certain "typical" symptoms to make a diagnosis, as we have no paralysis for guidance in diagnosis. It is therefore likely that some discrimination will occur in the selection of the non-paralytic cases, and therefore there would be a tendency towards a higher incidence of these "typical" symptoms in the observed figures for the non-paralytics. Whether this is the correct explanation is uncertain. Testing the proportions in (ii) and (iii) for homogeneity, we find that $\chi_c^2 = 3·914^*$, and $P < 0·05$, which

is just significant at the 0·05 level of probability. It could be a chance finding.

Some studies on the time interval between the onset of symptoms (earliest prodromal date) and the onset of (i) headache and (ii) vomiting, have been made, but on account of limitations of space will not be presented here. It can be shown ($P < 0·01$) that there is a tendency for vomiting to occur earlier in the non-paralytic than in the paralytic cases.

Some Comments on the Portal of Entry and Pathogenesis in Human Poliomyelitis.

There is considerable dispute as to the portals of entry in poliomyelitis occurring naturally in man. There is much epidemiological evidence that poliomyelitis is spread largely by contact (droplet), with many "silent" infections. The weight of opinion among epidemiologists appears to be moving back in this direction. The writer (1953) suggested that in the case of the previously tonsillectomized (at any interval) bulbar subject, the portal of entry was via the motor nerves from the tonsillar area of the pharynx to the *nucleus ambiguus* in the medulla. Fowler (1951) had shown from a histopathological study of fatal cases in the 1947-1948 South Australian epidemic the heavy damage to the *nucleus ambiguus* in fatal bulbar cases. Lesions of the *nucleus ambiguus* in such cases had been observed previously, by Perkins and Dudgeon (1907), Magni (1925), Kino (1928), Sabin and Ward (1941), Howe and Bodian (1942), Luhan (1946), Peers and Lillie (1949), and Baker *et alii* (1950). Fowler's series of fatal bulbar cases included no non-tonsillectomized subject, and at present it is not known whether there is comparable damage to the *nucleus ambiguus* in the non-tonsillectomized subject of bulbar poliomyelitis. The examination of the clinical evidence of lesions of the *nucleus ambiguus*, earlier (Southcott, 1954), showed no evidence that the incidence of such lesions differed between the tonsillectomized and non-tonsillectomized. Whether it is possible to ascribe the same portal of entry to the non-tonsillectomized subject of bulbar poliomyelitis is uncertain. That the pathogenesis of the disease differs between these two classes (tonsillectomized or not) of bulbar subjects is indicated by the finding that abducens lesions are significantly more frequent in the non-tonsillectomized class. It is nevertheless quite possible that the portal of entry in the non-tonsillectomized bulbar subjects is the same as has been suggested for the tonsillectomized.

It appears legitimate to propose that the association between oculomotor lesions and bulbar lesions is, in the tonsillectomized class at least, due to the virus spreading forwards along the brain stem from connexions with the *nucleus ambiguus* to reach the oculomotor nuclei. The median longitudinal bundle is a possible axonal pathway which could account for this spread (see Swan, 1939).

Summary.

1. The relationships between encephalitic, bulbar and spinal manifestations in paralytic poliomyelitis cases are studied. It is shown that there is a strong association between encephalitic and bulbar manifestations. The mechanism of this is discussed. It is pointed out that there appears little to be gained by extending the term "bulbar" to include all brain stem lesions, including, for example, oculomotor lesions, as some writers have done, and that the term "brain stem poliomyelitis" is better in such cases.

2. When the term "bulbar" is used in the restricted sense that has been adopted in these studies, it is shown that there is an association between oculomotor manifestations and bulbar manifestations.

3. An analysis of incidence of symptoms and death in various clinical sub-groups is presented. The association between bulbar manifestations and death is confirmed by these further studies.

4. It is shown that in bulbar poliomyelitis there is a significantly higher incidence of vomiting than in non-bulbar poliomyelitis. It is suggested that this effect is due to lesions of the medullary vomiting centre, analogous to lesions of the medullary respiratory and circulatory centres in bulbar poliomyelitis. It is postulated that there are two mechanisms of vomiting in poliomyelitis. The first is central (medullary) vomiting, due to interference with the medullary vomiting centre from local invasion with virus. It is considered that this mechanism operates only in the bulbar cases. The second form is vomiting initiated from local effects within the gastro-intestinal tract. It is considered that this mechanism may operate in all forms of poliomyelitis, including non-paralytic, non-bulbar paralytic, and also bulbar.

5. Some studies on the time interval between onset of symptoms (earliest prodromal date) and the onset of headache and vomiting have been made. It can be shown that there is a tendency for vomiting to occur earlier in the non-paralytic than in the paralytic cases.

6. Some aspects of pathogenesis are discussed. It was suggested earlier that in the tonsillectomized (long before or recently) bulbar subjects the virus gained entry from the tonsillar area along the motor nerve fibres to the *nucleus ambiguus*, and from there to the neighbouring medullary reticular areas. It is suggested that the medullary vomiting centre is included in this mechanism, as well as the respiratory and circulatory centres. It is proposed that in the tonsillectomized bulbar subjects the virus spreads forwards from connexions with the *nucleus ambiguus* along the brain stem to involve the oculomotor nuclei. That the pathogenesis differs between the tonsillectomized and non-tonsillectomized is indicated by the higher incidence of abducens lesions in the non-tonsillectomized bulbar class.

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PROBLEMS WHICH SURGEONS CREATE FOR ANÆSTHETISTS.

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THE title of this paper implies that surgeons possess divine attributes, a pretension which some of them are not slow to exhibit. Presumably, therefore, surgeons can do no wrong; yet it is common experience that they are often the cause of much trouble, frustration, anxiety and even loss to anæsthetists. Too often, perhaps, the reverse applies; badly-conducted anæsthesia can seriously impair the surgeon's convenience, temper and work, apart from its deleterious effects on the unfortunate patient. This, however, is not the subject under discussion, as the title of this paper also indicates.

Legal Hazards.

Of course, sound training of both surgeons and anæsthetists is an imperative necessity for the overall success of surgical interventions. In practice, however, competence varies widely; expert anæsthesia not infrequently compensates for indifferent surgery, and *vice versa*. Thanks to the reparative capacity of the human organism and its ability to withstand abuse, much surgery of dubious merit is carried out with fairly good results. However, it is not so easy to avoid the penalties of bad anæsthesia. While these are not commonly lethal, they frequently involve, for the patient, increased morbidity and delayed recovery. Hence the amateur operator will often utilize the help of trained anæsthetists, especially in his more daring adventures. The problem here is that of legal liability. In the event of some bad or crippling result, to what extent might the anæsthetist, as an accessory, be held culpable were surgical ineptitude or negligence proven? The usual reply to this query is: "None at all, for anybody may perform a surgical operation if the patient is a willing party; and if he chooses to have an ordinary doctor for his surgical treatment he must put up with the consequences." This is perilous thinking, which ignores the moral considerations involved.

It is all very well to assert that anæsthetists should not work with such untrained or incompetent surgeons. But these engagements are difficult to avoid without giving offence or, indeed, taking other legal risks, and anyway economic realities must be faced. Undoubtedly the time is ripe for the registration of specialists, surgical and other. Meanwhile the situation could be alleviated if properly qualified surgeons had recourse less frequently to the services of undistinguished anæsthetists, so providing more opportunities for the trained men.

Economic Aspects.

Great discrepancies exist in the esteem and monetary rewards enjoyed by surgeons and anæsthetists respectively for their services to the community. These are very well exemplified in the recently promulgated schedule of Commonwealth medical benefits, which, although superficially equitable, accords patients really quite limited help in respect of anæsthetic and allied services, in comparison with its exhaustive surgical provisions. Specific reference to many important anæsthetic items and contingencies is altogether lacking, while it appears, for example, that intubation of the larynx by anyone but an anæsthetist is a beneficial procedure. The long traditions and higher standing of surgeons, together with the virtual anonymity of anæsthetists, favour such invidious discrimination, of which many other examples can be found. The outmoded idea that the anæsthetic is any fool's business still persists, not only in responsible medical circles, but also among hospital authorities, government officials and the public as well. Surgeons in general are apparently not averse to the perpetuation of these anomalies, and thus play a major part in creating serious economic problems for anæsthetists.

Many surgeons consider that were it not for their enterprise and daring there would be no employment for anæsthetists and others concerned in surgical operations. This naïve assumption ignores the fact that the patient himself is the real source of such common benefit, and it is about as illogical as the claim that a certain nation alone won the two World Wars. An operation involves much more than mere surgery, and the anæsthetic can be a major, and sometimes the most important, component of the procedure. Due practical recognition of this fact is very rarely forthcoming.

None can deny the enormous benefits of good anæsthesia, yet there are surgeons who seek to preserve a degraded status for anæsthetists; who decry their achievements; who ridicule their knowledge and skill; and who offer minimal reward for their services. Others affect a sublime indifference to the anæsthetist's convenience and obligations, giving inadequate information about patients, making awkward short-notice changes of plan, monopolizing operating theatre facilities and the limited nursing help available, and often dallying unconscionably over the work in hand. Loud in their denunciation of unpunctuality, they are frequently and euphemistically delayed themselves, and so become the main cause of the anæsthetist's subsequent lateness elsewhere. These various factors play havoc with the latter's disposition and dispositions, and all too commonly necessitate the sacrifice of one or more of his later engagements. Such lost opportunities are quite irrevocable, for, unlike most surgical appointments, they cannot be readily postponed and rearranged.

Further, these inconsiderate persons will often fail, even in very serious cases, to have various essential preliminary tests carried out, notably estimations of haemoglobin values, blood typing and investigation of the Rh status. This neglect causes great inconvenience to anæsthetists, pathologists, blood banks *et cetera*, and may involve the patient in substantially increased risks. Another obnoxious practice, which surgeons largely condone, is the admission of patients to hospital late in the evening preceding or, worse, on the morning of some major procedure, so that the anæsthetist has little opportunity to examine, reassure and prepare his subject beforehand. Much bad anæsthesia and even deaths have been attributable to such thoughtlessness.

Again, there is the surgeon who, taking umbrage at some triviality and in the absence of any mutual discussion whatever, will divert his patronage elsewhere and thus

attempt to subject his delinquent anæsthetist to the penalty of economic sanctions. This is surely a disgraceful way to treat a professional colleague, even one whose value as a source of referred work is admittedly small. Happily, there is substantial unity and liaison today among trained anæsthetists, as well as much compensatory interchange of work, so that individually and as a body they are better able to withstand such deprivation and discourtesy.

A further common sport of surgeons is indulgence in the device of psychic projection, whereby imputations of carelessness, ineptitude, stupidity, cupidity *et cetera* are directed, humorously perhaps, against anæsthetists. The psychiatrists tell me that such expressions derive from similar deep-seated feelings of inadequacy in the perpetrators themselves.

Ethical Considerations.

Another problem for the anæsthetist is the quoting and collection of fees by surgeons on his behalf. This custom almost invariably results in a disproportionately low return for his indispensable services. While perhaps justifiable if a thorough understanding exists between him and the surgeon, the practice is most reprehensible when adopted by the latter without due consultation. Yet many surgeons will make arrangements of this sort, leading either to inadequate payment of the anæsthetist or to resentful protest from the patient when the bill is received. It is frequently not realized that operations thought to be of minor character often become major and prolonged affairs; that promised "whiffs" and "needle-pricks" are often quite inadequate; and that anyway the anæsthetist must transport himself and his gear to and from the scene of such surgical benevolence. These considerations apply especially to operations performed on unprepared patients in the consulting room, with its commonly poor facilities.

In general it is far better for the anæsthetist to assess and make his own charges; but even this ideal is sometimes vitiated by surgeons who deliberately misrepresent the anæsthetic as a mere triviality, perhaps so as to enhance their own stature in the patient's estimation. Such psychic compensation, whereby the virtues and due rewards of others are shamelessly misappropriated, is all too common.

If in any circumstances some concession is indicated, it should be sufficient to tell the patient that the anæsthetist will be asked to charge at an intermediate rate. Hospital accommodation is so expensive now that the anæsthetic fee is a comparatively small item in the patient's operative liabilities. Therefore, in attempting to reduce the burden, it is inequitable to oblige the anæsthetist to make any substantial concession. A 25% or 50% reduction of their respective fees has a far more severe financial impact on the anæsthetist than on the surgeon, whose larger claim affords much more latitude in this regard.

In most parts of this country it is becoming established custom for anæsthetists, as consultants, to adjust financial matters directly with their patients. Thus their interests are decreasingly subject to the hazards of surgical parsimony, caprice and amnesia. In one State at least, however, surgeons continue to exercise a rigid control in this respect, to the great detriment of their anæsthetists and anæsthetics. The practice is contrary to the long-established right of any medical practitioner to determine his own fee and to look to the patient for its payment. In Victoria an admirable law ensures such liberty of action.

Future Prospects.

Surgeons who hold the foregoing obsolescent views about anæsthetists do a grave disservice not only to themselves and their speciality, but also to the community in general. Indeed, they are thus responsible for much of the bad anæsthesia prevalent today, because their attitude emphasizes the low status and indifferent prospects of a career in anæsthetics. Consequently it becomes difficult to find good candidates for training and other posts, while the full development of modern anæsthetic services and teaching in the larger institutions is hampered. Here again Victoria has shown the way by the establishment at various hospitals of anæsthetic departments, each under competent directorship.

Contrary to widespread surgical and lay belief, the acquisition of reasonably comprehensive knowledge and skill in specialized anæsthetics is not a matter of a few weeks' training, but of at least two or three years' intensive post-graduate study and practical work. Fortunately, many surgeons, both senior and junior, have a lively appreciation of the situation, and they accord their anæsthetist colleagues much encouragement, support and other deserved recognition. The recent establishment of the Faculty of Anæsthetists of the Royal Australasian College of Surgeons marks a great step forward in this respect.

No apology is made for this seemingly paranoid exposition of the anæsthetist's disabilities. The facts are incontestable and the need for much improvement of his standing in the profession and community is obvious, mainly because its satisfaction will result in the saving of more lives. Finally, it should never be forgotten by surgeons and anæsthetists alike that the patient, although passive in role, is the protagonist in the grim drama of a surgical operation.

PREPARATION OF FREEZE-DRIED ARTERIAL GRAFTS.

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THE rapidly widening field of vascular surgery now calls for the provision of an assured supply of tissue suitable for grafting purposes. In view of the difficulty in obtaining donor material at the right time, it has become imperative to have a technique of storage so that all the large vessels can be removed and stored when a suitable subject is available.

Storage in balanced salt solution at about 5° C. results in wastage of many of the grafts, since there appears to be a limit of about one month after collection during which it is safe to use tissue stored under these conditions (Eastcott, 1953).

The requirements of an artery bank (Eastcott, 1953) are as follows: (i) Grafts must be sterile and safe to use. (ii) It should be possible to store the grafts indefinitely. (iii) Grafts should be transportable.

To meet these requirements Eastcott described the technique of "snap freezing", in which the tissue is rapidly frozen in a mixture of dry ice and alcohol at −79° C. Rapid freezing reduces the size of the ice crystals and hence minimizes the possible cellular damage due to this mechanical distortion. Furthermore, this process prevents localized high concentrations of electrolytes, the occurrence of which may lead to protein denaturation. Protein denaturation, besides possibly weakening the tissue structurally, may increase the reaction of the host to the donor tissue.

Once frozen, the tissue can be kept for an indefinite period in a bank consisting of a commercial "deep freeze" running at −20° C. Within this deep freeze is an insulated box divided into compartments. The outer compartments are filled with solid carbon dioxide and the grafts are kept in the inner compartments.

The shortcomings of this type of bank are as follows: (i) The "deep freeze" must be kept running continuously. Apart from the cost, there is the possibility of breakdown of the apparatus, which is a continual hazard, though admittedly slight. (ii) The dry ice in the outer compartments needs to be replenished about every three days. (iii) To transport the specimens it is necessary to carry the whole insulated box, well packed with dry ice.

To overcome these difficulties, numerous workers in England and America have recently been experimenting with the process of freeze-drying in the preservation of arterial segments for grafting. The process is termed lyophilization.

[1] Working under a grant from The Royal Australasian College of Physicians.

Swan (1953) described the use of lyophilized arterial homografts in man, some of the grafts having been preserved for over eighteen months. Pate and Sawyer (1953) gave some slight indication of the conditions under which the freeze-drying occurred, but in describing their apparatus they merely stated that a slightly modified commercial freeze-drying machine was used.

Once freeze-dried, the tissue is kept in a sealed tube *in vacuo* at room temperature and requires no more attention.

The advantages of this technique are the ease of storage without cost and the ease of transport. An attempt was made in this hospital to prepare vascular grafts by this method.

Preliminary inquiries late in 1953 revealed that there was no suitable freeze-drier available in Australia. Early this year further reports from overseas confirmed the value of freeze-drying. Pate and Sawyer (1953) gave a detailed account of the elastic characteristics of fresh and freeze-dried aortic grafts, and suggested that the lyophilized graft was at least as good as, and possibly better than, a fresh homograft.

In December, 1953, Brown *et alii* gave a long account of the clinical uses of this type of tissue. They stated that they had used grafts which had been prepared by this technique over two years before, with excellent results. They held that the incidence of complicating thrombosis and hæmorrhage was lower and replacement of the freeze-dried graft with host tissue was more rapid, while at the same time there was less foreign tissue response compared with that obtained with fresh arterial homografts.

In view of this it was decided to undertake the construction of a freeze-drier for the experimental processing of animal arteries and their subsequent grafting, to gain experience in the techniques of both freeze-drying and vascular grafting.

Since insufficient details were available from the literature, consultations were held with members of the Institute of Medical Research of this hospital, the University of Sydney (veterinary science school and physiology and biochemistry departments), the Commonwealth Scientific and Industrial Research Organization Food Preservation Laboratory at Homebush, and that organization's Department of Fisheries at Cronulla. Freeze-driers in use by some of these departments were not suitable for freeze-drying long lengths of aorta; they were all concerned with tray-drying of protein solutions, food preparations, sea mud *et cetera*. The special problems associated with the drying of blood vessels lie mainly in their length, their bulk (the weight of water to be removed) and the particular avoidance of structural damage by ice crystallization and protein denaturation as was previously mentioned.

With the experience gained from the sources mentioned an apparatus was constructed by a commercial glass-blower (see Figure I).

The method of drying two tissue samples simultaneously is as follows.

The lengths of vessel are removed with full aseptic precautions, washed in Ringer's solution containing penicillin and streptomycin (400 units of each to the cubic centimetre) and placed in sterile three-quarter inch soft glass test tubes. These in turn are placed in the sterile freezing tubes (labelled A), which are then partially immersed in a freezing solution of dry ice and alcohol. The drying finger (labelled B) is filled with alcohol dry-ice freezing mixture. Some of this mixture is also added to a "Thermos" flask surrounding the second water trap (labelled C).

The two freezing tubes containing the samples are attached to the apparatus and again surrounded by the freezing mixture in the large "Thermos" flask. The vacuum pump is started. When a pressure of 100μ or better is achieved in the apparatus (measured with a vacuostat gauge), the freezing mixture surrounding the samples is withdrawn, since latent heat of vaporization keeps the samples at a low temperature until the bulk of the water is removed. Once this has occurred, the temperature of the specimens slowly rises until at the end of about eight hours the bulk of the water has sublimed off the specimens, which are now at about room temperature. This first stage may be termed the primary drying stage.

In the secondary drying stage the soft glass test tubes are removed from the apparatus and placed in a vacuum desiccator containing phosphorus pentoxide, and the desiccator is evacuated. The tissue is left over the prosphorus pentoxide for three days, by which time all the water which can be removed has left the specimens.

After drying is completed, the mouths of the soft glass test tubes are drawn out to give a cone of suitable diameter to fit securely into the rubber tube leading to the vacuum pump. The test tube is evacuated and sealed under vacuum by heating the narrowed neck of the tube with a Bunsen burner.

Arterial segments freeze-dried as described have been reconstituted by adding normal saline at room temperature. As far as can be judged by appearances, the reconstituted

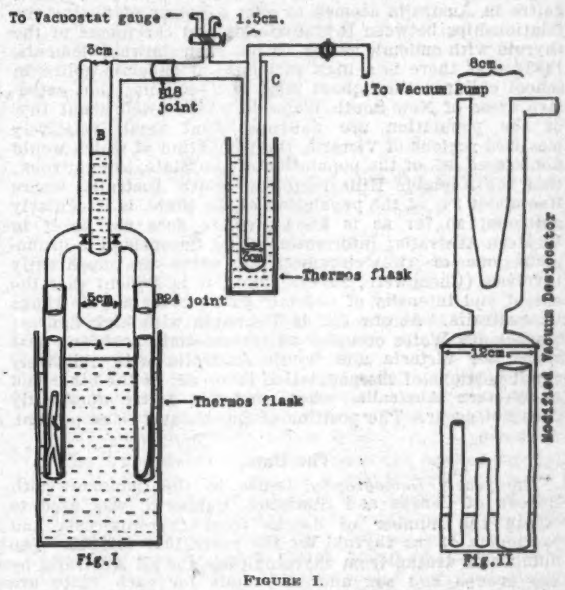

FIGURE I.

segments are in good condition. The crucial tests of fitness of such segments are, of course, the surgical replacement at present being carried out in the experimental animal.

The apparatus has several defects, as follows: (i) Its capacity is limited to two specimens at a time. (ii) The diameter of the freezing tubes is too narrow to take a human aorta. (iii) During the primary drying stage the water leaving the specimens is trapped opposite the inlets (marked X) and tends to obstruct the openings. (iv) It is not possible to empty the water without dismantling the whole apparatus. Owing to its fragility, this exposes it to the possibility of breakage. This in fact has occurred with the present apparatus. A modification of the apparatus is shown in Figure II. This is less likely to break and will hold larger specimens.

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THE RELATIONSHIP OF THYROTOXICOSIS AND CARCINOMA OF THE THYROID TO ENDEMIC GOITRE.

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IN December, 1952, the World Health Organization called together, in London, a study group on endemic goitre. When considering the public health importance of endemic goitre, the group concluded that "the few existing surveys suggest that mortality from hyperthyroidism is greater in certain areas in which goitre is endemic, but much more evidence is needed before an association can be postulated". Because of the paucity of data "the group found itself unable to express an opinion on the relation of carcinoma (of the thyroid) to endemic goitre". (World Health Organization, 1953.)

The peculiar character of the distribution of endemic goitre in Australia seemed to offer a means of testing the relationships between thyrotoxicosis and carcinoma of the thyroid with endemic goitre. It has been shown (Clements, 1953) that there is a high incidence of endemic goitre in school children throughout most of Tasmania; that extensive areas of New South Wales in which dwell about 10% of the population are goitrous; that small relatively localized regions of Victoria, the population of which would not exceed 3% of the population of the State, are goitrous; that the Adelaide Hills region of South Australia, where live about 3% of the population of the State, is irregularly goitrous; so far as is known goitre does not occur in Western Australia; information about Queensland is incomplete, one or two circumscribed areas are apparently involved (Chenoweth, 1954). Thus, it is evident that the extent and intensity of endemic goitre cover a wide range in Australia. At one end is Tasmania with high figures; New South Wales occupies an intermediate position; next there are Victoria and South Australia with relatively small portions of the population involved; at the other end is Western Australia, where endemic goitre apparently does not occur. The position of Queensland is, at present, unknown.

The Data.

The yearly *Demography*, issued by the Commonwealth Bureau of Census and Statistics, Canberra, was used to obtain the number of deaths from thyrotoxicosis and carcinoma of the thyroid for the years 1911 to 1952. The number of deaths from thyrotoxicosis for all Australia by age groups and sex and the totals for each State are available since 1908. Not so the data for carcinoma of the thyroid, which was not listed separately as a cause of death prior to 1950. Thus, it has been possible to analyse the deaths from this condition only for the years 1950 to 1952.

It was decided that the most satisfactory way to study the death rates for both thyrotoxicosis and carcinoma by States was to compare the actual number of deaths with the expected number. The latter is a calculated figure based on the assumption that the conditions which operate over the whole of Australia apply with equal force in each State; in other words, the calculated figure denies the existence of peculiar ætiological factors in any State. The expected number of deaths for each State is obtained by applying the death rates for each age group and sex for Australia to the number of people in each age group in each State, and totalling the figures obtained. This procedure takes into account the age-sex distribution peculiar to each State.

The difference between the expected and actual number of deaths for each period and for each State was compared with its approximate standard error by means of the formula:

$$\frac{\text{Difference between expected and actual deaths}}{\sqrt{\text{Expected deaths}}} = A$$

If A was greater than 2, the difference was judged to be significant.

[1] Endowed by the Commonwealth Department of Health.

During the analysis of the data for deaths from thyrotoxicosis, it became apparent that a number of changes has occurred in the death rates from this condition over the last forty years. This is not unexpected, for there have been considerable changes in the diagnosis and treatment of thyrotoxicosis over this period.

Although a study of the mortality pattern of thyrotoxicosis was not intended when this project was planned, the possible effects of these secular changes in death rates on the hypothesis under consideration could not be ignored. The study was therefore widened to include an analysis of the trends of mortality.

Results.

Thyrotoxicosis.

The number of deaths and the death rates for thyrotoxicosis for all Australia for the forty years 1911 to 1950 in five-year periods are given in Table I; the death rates

TABLE I.

Thyrotoxicosis: Deaths and Death Rates per Million.

Period.	Males.		Females.	
	Number of Deaths.	Death Rate.	Number of Deaths.	Death Rate.
1911 to 1915 ..	33	2·6	249	21·7
1916 to 1920 ..	20	1·5	334	26·3
1921 to 1925 ..	31	2·1	333	23·8
1926 to 1930 ..	53	3·3	475	30·9
1931 to 1935 ..	85	5·1	581	35·6
1936 to 1940 ..	120	6·9	720	42·2
1941 to 1945 ..	104	5·7	556	30·9
1946 to 1950 ..	64	3·3	306	15·9

for each of the six States for three periods are given in Table II. The age-specific curves of mortality for thyrotoxicosis for females for three periods are shown in Figure I.

The comparison of the numbers of actual and expected deaths for both sexes for each State for three periods is given in Table III, in which the degree of significance of the difference between all sets of figures is shown by superior figures.

TABLE II.

Thyrotoxicosis: Death Rates per Million.

State.	Sex.	Death Rates per Million.		
		1931 to 1940.	1941 to 1945.	1946 to 1950.
New South Wales ..	M.	6·7	7·1	3·4
Victoria	M.	6·7	6·1	3·4
Queensland	M.	4·3	2·9	3·1
South Australia ..	M.	5·1	6·5	3·7
Western Australia ..	M.	3·4	1·6	1·5
Tasmania	M.	11·8	12·9	8·6
New South Wales ..	F.	43·7	39·0	15·8
Victoria	F.	35·5	34·2	15·1
Queensland	F.	41·1	28·5	15·4
South Australia ..	F.	24·5	14·8	10·1
Western Australia ..	F.	27·4	8·8	10·9
Tasmania	F.	68·0	59·5	37·1

Carcinoma.

The comparison of the number of actual and expected deaths from carcinoma of the thyroid is given in Table IV

Discussion.

Thyrotoxicosis.

The hypothesis which is being tested in this paper is that, because of the great differences in the incidence of endemic goitre in the various States, there should be a significant difference in the death rates from thyrotoxicosis in the various States, if endemic goitre is a predisposing factor to thyrotoxicosis.

Before the evidence relating to this hypothesis is considered, the trends in mortality in Australia will be reviewed. The crude death rates in Table I show a steady rise to peaks in the 1936 to 1940 period, with pronounced falls in the two succeeding periods. These falls are demonstrated in an even more spectacular way in Table II; the death rates in the period from 1946 to 1950 are a third of what they were in the period from 1931 to 1940. Figures for 1951 and 1952, not given in this paper, show that the decline started in the period 1941 to 1945 has been maintained. Another interesting feature of Table II is the different gradients of decline in the various States. The most pronounced falls have been in New South Wales, Victoria and Western Australia, the smallest decline has been in Tasmania. The significance of these differences will be discussed later.

Figure I contains some interesting information. Not only does it confirm the lower rates in the most recent quinquennial period compared with the other two, but it

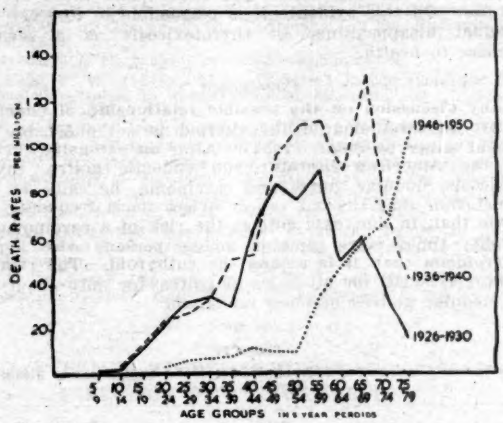

FIGURE I.
Death rates for females for thyrotoxicosis in five-year periods.

shows an apparent change in the age selection. In the earlier periods mortality rates were much higher in childhood and early adult life. In the most recent period the peak of mortality is in the second half of the life-span, with a rising rate in each age group; the highest figures are for the seventy-five to seventy-nine years age group. This is usually interpreted that an individual encounters his greatest risk of death from thyrotoxicosis after the age of sixty years. However, there is no justification to assume that all the forces responsible for this actually operate at this age. Frost (1939) has shown that with diseases of long standing like tuberculosis, death occurs at a different age from that at which the persons are subjected to the noxious stimuli. Frost used the death rates of cohorts to demonstrate this point.

The death rates for thyrotoxicosis in Australia by age groups for females for a number of cohorts are shown in Figure II. The cohort of 1880 represents the mortality pattern of females who were aged zero to nine years in 1880; similarly for the other cohorts. It will be seen that

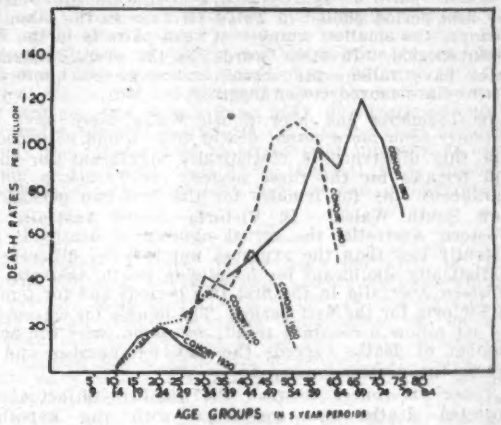

FIGURE II.
Death rates for females for thyrotoxicosis arranged in cohorts.

the mortality rates at each age for succeeding cohorts are less than for the preceding cohorts. It would seem that the present day peaks of mortality seen in the 1946-1950 curve (Figure I) occur in a generation of people who have been subjected to an unfavourable experience in earlier life, and who, as a result, have suffered higher mortality rates throughout their whole lives.

The lower mortality rates at each age in each succeeding cohort (Figure II) suggests a progressive decline in the forces which are responsible for mortality. With the advances in our knowledge of the physiology of the thyroid, the improvement in surgical techniques and the discovery and wide use of the thiourea group of drugs, the first thought is that this is the outcome of improved diagnosis and treatment of persons with thyrotoxicosis. If this was so, the reduction in mortality rates should be uniform through all age groups in the 1946-1050 curve (Figure I); whereas the numbers of deaths for people aged over sixty years are much higher than those for the corresponding age groups at earlier periods.

These facts could be explained, in part at least, by the existence in a higher percentage of the people of the

TABLE III.
Deaths from Thyrotoxicosis: Comparison of Actual and Expected Deaths.

State.	Sex.	1931 to 1940		1941 to 1945		1946 to 1950	
		Actual.	Expected.	Actual.	Expected.	Actual.	Expected.
New South Wales	M.	91	82·4	48	41·4	26	25·3
Victoria	M.	61	57·6	30	29·2	18	19·0
Queensland	M.	22	30·4	8[1]	15·4[1]	8	9·6
South Australia	M.	15	18·4	10	9·4	6	5·9
Western Australia	M.	8[1]	14·8[1]	2[1]	7·2[1]	2	4·8
Tasmania	M.	14[3]	7·4[3]	8[3]	3·4[3]	6[3]	1·9[3]
New South Wales	F.	579[2]	508·5[2]	280[2]	240·6[2]	122	119·1
Victoria	F.	332[2]	392·0[2]	171	174·3	81	89·0
Queensland	F.	191[4]	167·2[4]	92	84·4	43	39·8
South Australia	F.	72[2]	122·1[2]	23[2]	53·3[2]	17	27·9
Western Australia	F.	58[2]	79·2[2]	10[2]	38·5[2]	14	18·0
Tasmania	F.	79[2]	40·1[2]	36[2]	20·9[2]	25[2]	8·2[2]

[1] Actual less than expected—difference almost significant.
[2] Actual greater than expected—difference significant.
[3] Actual less than expected—difference significant.
[4] Actual greater than expected—difference almost significant.

earlier cohorts (1880, 1890) and to a more intense degree, of factors which predispose to thyrotoxicosis.

To turn now to a consideration of the variations in mortality in the different States. The pairs of figures in Table III fall into three categories: (*a*) there is no significant difference between the number of actual and expected deaths; (*b*) the number of actual deaths is greater than the expected number; (*c*) the number of actual deaths is less than the expected number. There are more pairs of figures with a significant difference in the first period quoted in Table III than in the other two periods; the smallest number of such pairs is in the most recent period. In other words, as the overall mortality rates have fallen, the actual and expected number of deaths have moved closer together.

In Tasmania and New South Wales there have consistently been more actual deaths than would be expected, and this difference is statistically significant for males and females for the three periods for Tasmania, but is significant only for females for the first two periods for New South Wales. In Victoria, South Australia and Western Australia, the actual number of deaths is consistently less than the expected number, the difference is statistically significant for females in South Australia and Western Australia in the first two periods and for females in Victoria for the first period. The figures for Queensland do not follow a constant trend; for some pairs the actual number of deaths exceeds the expected number and for others the reverse occurred.

These differences between the numbers of actual and expected deaths are consistent with the hypothesis advanced. In other words, the States with a high incidence of endemic goitre, Tasmania and New South Wales, have many more deaths from thyrotoxicosis than would be expected; Tasmania with the higher incidence of endemic goitre has the more frequent and greater difference between the expected and actual deaths. The State with little or no endemic goitre, Western Australia, and those States with small percentages of the population affected, have fewer deaths than expected. Queensland occupies an indeterminate position; more extensive goitre surveys in that State might reveal more endemic goitre than has been recorded to date.

The decline in mortality rates for thyrotoxicosis in each succeeding cohort could be explained by a progressive reduction in the incidence and severity of endemic goitre over the past seventy years; this is suggested from clinical experience. Unfortunately, it does not seem possible to collect data to confirm the impressions frequently advanced by practitioners with long experience in well-recognized endemic goitre regions, that the numbers of adults with a large nodular goitre are considerably smaller nowadays than they were two or three decades ago.

On the mainland of Australia the few goitre surveys (Victoria, Education Department, 1915; Clements, 1948) made of school children would suggest that the incidence has declined. For Tasmania the picture, which is at present confused, may become clearer in the near future. A decline in the incidence of endemic goitre could be due to changes in the food supply patterns in the goitrous areas as much as to specific iodide prophylaxis, which has been patchy on the mainland of Australia, and intense in Tasmania only in the last few years. Up to the beginning of this century, a high percentage of almost all foodstuffs consumed by rural communities (the principal goitrous areas are mainly rural) was grown locally. Since then more and more of the food consumed in all localities on the mainland has come from widely scattered areas. The bulk handling of wheat, and the long-distance transport of fruit, vegetables and livestock and even of milk (particularly dried and evaporated) have been responsible for these changes. In this way people living in areas on the mainland where the iodide content of the soil is low, augment (albeit unconsciously) local supplies of iodide with that present in foodstuffs imported into the area. Milk, vegetables and fruits provide most of the iodides in a balanced diet. Tasmania is highly self-supporting in foodstuffs, and since most of the island appears to be goitrous there are few opportunities for the iodide content of the diet to be augmented by that present in foodstuffs produced from soil rich in iodides, and fish consumption, which has declined considerably in recent years, was never particularly high.

These differences in food production and distribution between the mainland and Tasmania could be a factor in the different rates of decline of the mortality from thyrotoxicosis in the various States over the last twenty years. The fall in mortality in Tasmania has not been as pronounced as in the other States. Because of its peculiar food supply pattern, it would seem that specific iodide prophylaxis is a more urgent and necessary step in that State than elsewhere in Australia.

The arguments discussed in this paper suggest that thyrotoxicosis must remain an important cause of mortality in Tasmania so long as the incidence of endemic goitre remains high.

This study of the mortality rates for thyrotoxicosis for successive generations of people has revealed that the death rates of each cohort are lower than those of the former. On this evidence it is reasonable to forecast the gradual disappearance of thyrotoxicosis as a serious menace to health.

Carcinoma.

Any discussion on the possible relationship of endemic goitre to carcinoma of the thyroid is cut short by the recent paper by Sokal (1954). After an extensive review of the American literature on endemic goitre, thyrotoxicosis, nodular goitre and carcinoma, he came to the conclusion that thyroid cancer arises more frequently in toxic than in non-toxic goitre; the risk of a carcinoma is twenty times more common among persons with hyperthyroidism than it is among the euthyroid. The risk of cancer is small for all types of goitre, for only about 1% of nodular goitres becomes malignant.

TABLE IV.

Deaths from Carcinoma of Thyroid, 1950 to 1952: Comparison of Actual and Expected Deaths.

State.	Males.		Females.	
	Actual.	Expected.	Actual.	Expected.
New South Wales	17·00	18·10	33	36·41
Victoria	14·00	18·23	25	28·40
Queensland ..	7·00	6·78	15	11·89
South Australia ..	5·00	4·11	11	8·73
Western Australia	1·00	3·27	8	5·66
Tasmania ..	3·00	1·51	3	2·91

A difficulty that has always to be considered in any discussion of carcinoma of the thyroid is the relatively low rate of diagnosis, especially during life, without recourse to biopsy. In a large series in the Lahey Clinic, Boston (Catell and Colcock, 1953), less than 50% of carcinomata were diagnosed clinically.

The figures in Table IV show only small differences between the numbers of actual and expected deaths; in no case are the differences significant. The difficulties of diagnosis and the small numbers involved would prevent the investigation of this portion of the hypothesis, if Sokal's work had not already rendered this unnecessary. It seems that the sequence of some, at least, of the cases of carcinoma of the thyroid has been: endemic goitre → thyrotoxicosis → cancer.

Summary.

1. The mortality from thyrotoxicosis in the various States in Australia has been analysed.

2. There has been a considerable decline in mortality from thyrotoxicosis; it is most pronounced in the last ten years. An important percentage of the deaths in recent years have occurred in people aged over sixty years. It has been shown that these represent the residue of people who have been subjected to a greater risk of death from

thyrotoxicosis throughout their lives and have probably suffered endemic goitre in earlier life.

3. The mortality rates for thyrotoxicosis have been highest in those States with the highest incidence of endemic goitre, and lowest in those States where endemic goitre does not occur.

4. It is suggested that a prominent factor in the steady decline in death rates from thyrotoxicosis is the decline in the incidence of endemic goitre, which is itself due to the more varied sources of foodstuffs consumed by people living in the traditionally goitre areas.

5. The death rates for thyrotoxicosis at the higher ages will decline in the near future.

6. An analysis of the mortality rates for carcinoma of the thyroid does not show a significant difference between the States. It is pointed out that the figures are small and the diagnosis is difficult.

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A FURTHER STUDY OF STAPHYLOCOCCAL INFECTION OF THE NEW-BORN.

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STAPHYLOCOCCAL INFECTION of the new-born in hospital nurseries has occurred widely in recent years, and epidemics of *pemphigus neonatorum* have been described in Denmark by Krag Andersen (1943), in England by Allison and Hobbs (1947) and Parker and Kennedy (1949), and in Sweden by Melin and Wallmark (1949). In Canada an extensive outbreak of puerperal mastitis was accompanied by pustular lesions in infants (Colbeck, 1949; Webb, 1954). From these epidemics the impression was gained that certain types of staphylococci may be more prone than others to cause infections of this character.

Studies in Australia (Rountree and Barbour, 1950; Isbister, 1951; Coventry and Isbister, 1951) showed that, in non-epidemic periods, there exists what may be regarded as a basic level of staphylococcal infection among the new-born due to the inevitable contact of these infants with environments more or less heavily contaminated with pathogenic staphylococci.

However, the evidence for the existence of specific types of *Staphylococcus aureus* causing the lesions of pemphigus or other pyogenic skin lesions such as abscesses is not altogether complete, since different serological or phage types seem to have caused these lesions in the various countries where epidemics have been investigated. It seems worth while, therefore, to record a further study of staphylococcal infection in new-born infants, in which a large proportion of lesions was caused by two particular phage types.

The opportunity for this study arose in May, 1952, when five infants in one nursery at the Royal North Shore Hospital of Sydney developed staphylococcal lesions somewhat different in character from those usually seen. Two of these babies had breast abscesses, one surrounded by cellulitis which spread extensively and rapidly in spite of penicillin therapy, and the remaining three had pustular skin lesions with surrounding cellulitis. It occurred to one of us (C.I.) that these lesions might be due to an epidemic strain of *Staph. aureus*, and phage typing was therefore instituted. From each of these five infants a strain of *Staph. aureus* was isolated which was untypable with the ordinary dilutions of phage used in routine typing, but which was lysed by the undiluted phages 47C and 52. An identical strain was the causal organism in a similar outbreak that occurred during June, 1952, in a maternity unit in a country hospital in Victoria. It was therefore decided to study the incidence of staphylococcal infection in the nurseries of the Royal North Shore Hospital in the succeeding months, and this was done until the end of September, 1953.

METHOD OF STUDY.

The mothers of these babies were delivered in the maternity section of the Royal North Shore Hospital, where there are two main nurseries, a premature nursery and a nursery in an annexe to which some babies are moved with their mothers after the fourth day. After discharge from hospital, babies that had occasioned any worry in hospital were examined at the weekly baby clinic. When necessary infected babies were readmitted to the children's ward of the hospital and mothers to the general wards. There, although they were in the care of other members of the honorary staff, it was in most cases possible to see these patients and to examine bacteriologically material from their lesions.

Instructions were issued to the nursing staff that swabs were to be taken from all babies showing any signs of clinical infection, such as "sticky eyes", pustules, paronychia, abscesses, offensive and inflamed or unusually moist umbilici, and also from umbilici of all jaundiced babies. Cultures were also made from the breast milk of mothers with mastitis. It is possible that some cases of clinical infection were not detected since the nursing staff may not have reported them; but so far as we are aware, the majority of infections were examined clinically and bacteriologically.

The following clinical information was recorded: (i) description of the lesion and date of its appearance; (ii) mother's health (prenatal and puerperal) and parity; (iii) details of the baby's birth, weight at birth, sex, feeding; (iv) treatment of maternal and babies' lesions with results.

Bacteriologically, details were recorded of the organism isolated, its antibiotic sensitivity to penicillin, streptomycin, "Aureomycin", chloramphenicol and "Terramycin", and its phage pattern.

RESULTS.

During the period under review, 2742 live babies were delivered in the hospital or admitted soon after delivery. *Staph. aureus* was isolated from 304 lesions occurring in babies while in the maternity block, either from lesions of the skin, eye or umbilicus, or in a few cases from more than one of these sites, and from a further 19 examined at the out-patient clinic, but almost certainly infected in hospital.

Phage Typing Results.

In Table I, the monthly incidence of various phage types has been set out. In the compilation of the table, when two or more isolations were made from separate sites in any individual baby, all have been included, since on occasions strains from separate sites differed in phage pattern.

Altogether 304 strains from in-patients were examined. Of the 93 strains obtained from skin lesions, 39 (42%) belonged to pattern 47C/52 (being lysed only by undiluted phages). A further 15 strains of this pattern were isolated from out-patient babies. This pattern disappeared in April, 1953, but towards the end of June a new type was found

TABLE I.

Staphylococcal Lesions: Monthly Incidence of Phage Types of Staphylococci.

Month.	Skin Lesions.			Umbilical Swabs.			Eye Swabs.			Other Sources.			Total.
	47C/52.	52AV.	Other.	47C/52.	51AV.	Other.	47C/52.	52AV.	Other.	47C/52.	52AV.	Other.	
1952:													
May ..	6	—	1	—	—	4	—	—	2	—	—	—	13
June ..	—	—	—	—	—	9	—	—	1	—	—	—	10
July ..	—	—	—	—	—	12	—	—	2	—	—	1	15
August ..	—	—	4	—	—	13	—	—	5	—	—	—	22
September ..	1	—	—	3	—	5	1	—	5	—	—	—	15
October ..	3	—	2	1	—	5	1	—	—	—	—	1	13
November ..	5	—	6	3	—	10	—	—	4	—	—	3	31
December ..	5	—	—	2	—	12	1	—	4	—	—	—	24
1953:													
January ..	4	—	1	3	—	6	2	—	1	—	—	2	19
February ..	7	—	5	1	—	4	3	—	3	—	—	—	23
March ..	5	—	8	1	—	6	1	—	3	—	—	—	24
April ..	3	—	2	—	—	7	2	—	3	—	—	—	17
May ..	—	—	2	—	—	6	—	—	3	—	—	1	12
June ..	—	1	3	—	1	2	—	—	2	—	—	1	10
July ..	—	2	3	—	1	9	—	2	2	—	—	2	21
August ..	—	5	7	—	—	7	—	1	—	—	—	—	20
September ..	—	—	2	—	—	1	—	1	11	—	—	—	15
Total ..	39	8	46	14	2	118	11	4	51	—	—	11	304

which caused pustular lesions similar to those caused by 47C/52. It was not until January, 1954, that we realized that this was another epidemic strain. The first strains isolated were lysed only by phages 52 and 52A applied undiluted, but in November a new phage was isolated by "adaptation" of undiluted phage 52A, and this phage has proved highly specific for these strains. In retrospect, we regard these strains lysed only by phages 52 and 52A undiluted as being of this new type. Provisionally, we will call these strains 52AV. Strains of pattern 47C/52 were reexamined in June, 1953, at the Staphylococcal Reference Laboratory of the Public Health Laboratory Service at Colindale. They behaved identically at Colindale, and in addition were not lysed by a number of phages, which are not ordinarily included in the typing phages, but which had been isolated in Canada by Dr. G. B. Leyton during investigations of puerperal mastitis.

The remaining 46 strains isolated from skin lesions belonged to a wide variety of different phage patterns, 28 patterns being distinguishable, none of which occurred more often than four times. Four of the strains were not typable. Of the strains from skin lesions, therefore, 50·5% belonged to two phage types, and in our opinion these two types may be regarded as "epidemic" ones, especially likely to cause skin lesions. Examination of the typing results of the strains isolated from umbilici supports this opinion. Of the 134 strains isolated from this site, 118 (88%) did not belong to the epidemic types, 24 different phage patterns being distinguishable and 17 strains not being typable. On the other hand, only 12% of the strains isolated from umbilici were of the "epidemic" types, and it may be contended that infection of the babies with these types more often resulted in skin lesions than did infection with other types. Similarly, 51 (77%) of the 66 strains isolated from "sticky eyes" belonged to a wide variety of phage patterns, and only 15 (23%) to the "epidemic" types.

Antibiotic Sensitivity of the Strains.

Table II shows the sensitivities of the 304 strains of *Staph. aureus* to penicillin, streptomycin, "Aureomycin" and "Terramycin". Sensitivity tests to chloramphenicol were carried out, but the results are not included in the table. Of the strains belonging to 47C/52 phage pattern, all but one were penicillin-resistant, four were resistant to "Aureomycin" and "Terramycin" and one was resistant to all five antibiotics. Of the 14 strains of 52AV phage pattern, all were penicillin-resistant but sensitive to the other four antibiotics. In contrast to these epidemic strains, it was found that of the 226 strains belonging to other phage types, 127 (56%) were penicillin-resistant; 46 of these 226 strains were isolated from skin lesions, and in this group 70% were penicillin-resistant. Only eight of the 304 strains were resistant to streptomycin; since the advent of "Aureomycin" and later of chloramphenicol and "Terramycin", this drug is seldom used in the treatment of pyogenic infections. The fact that *Staph. aureus* can develop resistance to streptomycin very readily is shown by the work of Rountree and Thomson (1952), who found that the monthly incidence of streptomycin-resistant strains of *Staph. aureus* from in-patient infections in the Royal Prince Alfred Hospital was 27·6% of all strains of *Staph. aureus* isolated. This figure is still at about the same level at the Royal Prince Alfred Hospital, but the incidence of streptomycin-resistant strains seems to be lower in hospitals where this drug was not used so extensively or so early in the treatment of pyogenic infections.

TABLE II.

Antibiotic Sensitivity of the Strains of Staphylococci.

Antibiotic.	Skin.			Umbilicus.			Eye.			Nose.		
	47C/52.	Other.	52AV.	47C/52.	Other.	52AV.	47C/52.	Other.	52AV.	47C/52.	Other.	52AV.
Penicillin:												
Sensitive	—	14	—	—	59	—	1	24	—	—	2	—
Resistant	39	32	8	14	89	2	10	27	4	—	9	—
Streptomycin:												
Sensitive	38	46	8	14	115	2	10	48	4	—	11	—
Resistant	1	—	—	—	3	—	1	3	—	—	—	—
"Aureomycin" and "Terramycin":												
Sensitive	35	42	8	14	114	2	10	48	4	—	11	—
Resistant	4	3	—	—	4	—	1	3	—	—	—	—

Epidemiology.

The Clinical Picture: Babies.

The skin lesions in our first five cases caused by strains of phage type 47C/52 seemed to have more local reaction than we had previously seen; an attempt was therefore made to detect lesions due to this type clinically, and it frequently proved possible to do so. However, there was not an absolute difference between these lesions and those previously encountered, and when local abscess formation occurred in the first two weeks of life we occasionally wrongly suspected other strains (phage pattern 3C twice, phage pattern 47st once, 52 or 52st six times, 52AV three times, and phage pattern 7/47D/31B once).

Skin Infections.—When the infecting organism was of phage pattern 47C/52, the pustules occurred mainly in the first week of life, were large in diameter (two to eight millimetres) and were surrounded by cellulitic reaction for another two or three millimetres. The first baby developed a rapidly spreading cellulitis involving the chest wall anteriorly and posteriorly while receiving penicillin, and would probably have died without "Aureomycin", to which it responded rapidly, though surgical drainage was required. Fourteen babies developed well-localized abscesses, five had breast abscesses and five developed infections after the neonatal period. One baby with congenital heart disease died twenty-four hours after the incision of an abscess. Apart from the first cases, none of these babies appeared to have any general reaction to the infection, which may partly be explained by the fact that we administered "Aureomycin" more promptly. Two had suppurative paronychia. During this period a number of babies developed indurated areas, but as they were treated with "Aureomycin" before pus formation no cultures were available. The less acute lesions that were treated locally without antibiotics showed a marked tendency to persist and recur, in several cases infecting other members of the family on the baby's return home.

There were 18 lesions due to the 52AV type, of which three were abscesses occurring in the first two weeks of life; the other skin lesions resembled those caused by phage type 47C/52. The lesions caused by other types were the same as those described previously (Isbister, 1951).

Eye Infections.—There was nothing distinctive about the conjunctivitis caused by phage type 47C/52, most cases conforming to the usual "sticky eye" pattern, though in some there was more local reaction than usual. Infections due to other types also conformed to the "sticky eye" pattern.

Umbilicus.—Of the 14 babies from whose umbilici staphylococci of phage pattern 47C/52 were recovered, five had local evidence of umbilical infection, eight had jaundice only (two of them were severely ill), and one was febrile and ill with no jaundice or local infection.

In most of the other cases in which *Staph. aureus* was grown on culture (from the umbilicus), a diagnosis of umbilical sepsis was not tenable. The results therefore can be taken only as indicating umbilical flora as demonstrated previously (Isbister and Coventry, 1951).

The Clinical Picture: Mothers.

The cases of mastitis in which *Staph. aureus* of pattern 47C/52 was recovered were often recognized as different clinically from the cases encountered during the previous period (Isbister, 1951), in which the infections had been mainly parenchymatous. The present infections were mainly interstitial, and attempts at culture from breast milk were often unsuccessful. Several lesions started from infected Montgomery's tubercles. Six had not been recognized as penicillin-resistant before the patient's readmission to a general ward of the hospital, and breast abscesses had developed during penicillin or sulphonamide therapy. One strain was resistant to "Aureomycin", but responded to streptomycin.

Mothers of Babies Infected with Staph. Aureus of Phage Pattern 47C/52.—Eighteen mothers had clinical staphylococcal infections; of these 13 had breast infections (nine caused by phage pattern 47C/52 and one by a different phage type; in three cases no culture was attempted), two infected wounds, one recurrent abscesses, one puerperal pyrexia, and one suppurative paronychia.

Mothers of Babies Infected by Other Phage Types.—Mothers of babies infected with other phage types were not fully analysed clinically. Six had mastitis, and in four of these cases the infecting organisms were of the same phage type in mother and baby. Seven mothers of babies with no clinical lesions developed mastitis due to staphylococci of various phage patterns.

History of the Epidemic Episodes.

In Figure I the monthly incidence of the strains of various phage types is illustrated. In May, 1952, when the first small outbreak occurred, all infected babies were immediately isolated and nursed in a separate nursery, and all who aroused suspicion of infection were treated with "Aureomycin" orally. Masks were not worn by the staff, and special precautions for sterilizing blankets, linen *et cetera* were taken only in relation to babies from the isolation ward. This outbreak was rapidly controlled, and no more cases occurred for three months.

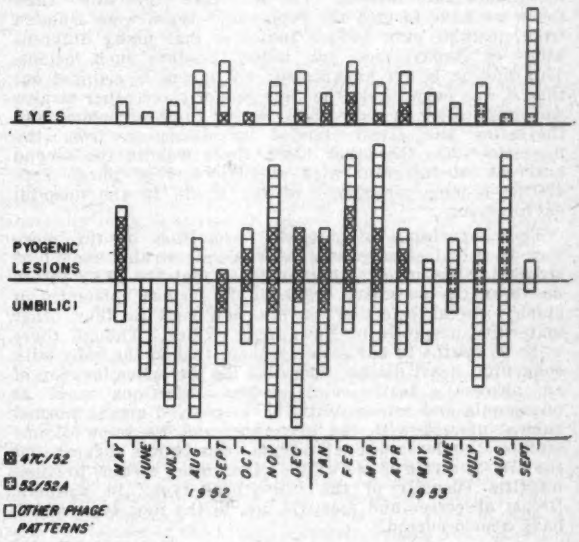

FIGURE I.

In September another outbreak occurred, again recognized clinically. The babies were isolated and barrier-nursed in the main nurseries, as the isolation nursery was not available. All infections responded to "Aureomycin", but cases continued to occur, and an effort was made to determine the source of infection by swabbing the noses and throats of the nursing and medical staffs. Twenty-five nurses from the obstetric block were nasal carriers of *Staph. aureus*. Of these, three carried 47C/52 phage type and eight carried other strains that had caused lesions in babies.

It was decided that the nursery staff should wear masks and take greater care about the risk of cross-infection by hand spread. The infection rate was unchanged in the following months. Blankets were then examined, cultures being prepared from the clean blankets returned from the laundry. Staphylococcus of phage type 47C/52 was grown on culture on several occasions. Blankets were then sterilized by being soaked in "Dettol" (1 in 40 solution) for eight to twelve hours before going to the laundry, and no further infections due to this phage type occurred. The total infection rate fell, and though several suspicious lesions were observed, no epidemic strain was suspected until January, 1954, when another outbreak occurred that was clinically recognizable as being different from the usual type and similar to those due to 47C/52. The strains isolated from these lesions were those identified as 52AV.

It then became apparent that 52AV, which had been isolated 14 times in the last five months of our investigation, was an "epidemic" strain. The isolation nursery was immediately reopened and all patients were treated with "Aureomycin". There were no further cases of infection with 52AV until June, 1954, when a fresh episode occurred. Blanket sterilization is being practised as described above; masks are used in the premature and labour wards, but have been given up for nurses in the general nursery. There have been no deaths due to the new epidemic type, though one baby was admitted to the general ward from another hospital and died of pneumonia due to *Staph. aureus* of this type.

Discussion.

The evidence obtained in the present study for the existence of particular phage types of *Staph. aureus* likely to cause skin lesions in the new-born lies chiefly in the frequency distributions of the types of staphylococci isolated from various sites in the babies. These show that many of the "non-epidemic" strains isolated from the umbilicus or from conjunctivitis had little or no tendency to produce skin lesions. The fact that types other than those we have termed the "epidemic" types were isolated from pustular skin lesions indicates that many different kinds of staphylococci can indeed produce such lesions. This finding is not unexpected; but it can be pointed out that it was only rarely that any one of these other strains was implicated on more than two or three occasions, and thereafter the strain tended to disappear from the nurseries. On the other hand, there was in the second outbreak of infection with staphylococci of phage type 47C/52 a long persistence of the strain in the hospital environment.

The importance of clinical recognition of the more serious skin lesions caused by epidemic strains should be stressed. We have further evidence that the 52AV strain has been the causative organism in serious epidemics of staphylococcal infection of the new-born in four other maternity hospitals in New South Wales. Though there were no deaths in our series (except that of the baby with congenital heart disease who died the day after incision of an abscess), deaths and serious infections such as pneumonia and osteomyelitis have occurred among normal babies infected with the new type, and we know of one mother who developed septicæmia. Our figures suggest that the 47C/52 strain is more likely than other strains to cause mastitis (usually of the interstitial type) in mothers. Breast abscesses and mastitis due to the new type, 52AV, have also occurred.

Conclusions.

1. There seems to be sufficient evidence in this study to prove the existence of two epidemic strains of staphylococci that are particularly prone to cause skin infections in the new-born.

2. These skin lesions caused by epidemic strains could usually be recognized clinically by an alert staff. If the more serious skin lesions described above are treated promptly and the patients are isolated adequately, much infant morbidity can be avoided.

3. The "epidemic" strains seem more likely to cause mastitis and breast abscesses in the mothers.

4. The most effective measures taken to control the infection proved to be adequate sterilization of blankets and immediate isolation and prompt treatment of infected babies with a tetracycline derivative, together with education of the nursing staff in prevention of cross-infection. Masks were ineffective as a general measure, but used correctly in labour ward and premature ward would seem essential, as there is no doubt that nurses become nasal carriers of the epidemic strains and may harbour them for some time. Elimination of this carrier state may be an important step in controlling outbreaks of infection.

5. All the epidemic strains of *Staph. aureus* were penicillin-resistant bacteriologically and clinically. This stresses the importance of sensitivity tests when these infections are being treated, and the futility and danger of persisting with penicillin therapy unless there is prompt clinical response—that is, within twenty-four hours.

Summary.

Staph. aureus was isolated from 304 lesions in babies delivered in a maternity hospital between May, 1952, and September, 1953.

By the use of phage typing two "epidemic" strains were identified as the causative organisms of skin lesions in the babies and breast infections in their mothers. These strains were resistant to penicillin.

The clinical picture of infection in the babies and methods used to investigate and control the infections are described.

Acknowledgements.

The phage typing at the Fairfax Institute of Pathology was supported by a grant from the National Health and Medical Research Council of the Commonwealth of Australia. One of us (C.I.) was working with a grant from The Royal Australasian College of Physicians, and in conjunction with the staff of the Institute of Medical Research at the Royal North Shore Hospital of Sydney.

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Reviews.

Preservation and Transplantation of Normal Tissue. Edited by G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., and Margaret P. Cameron, M.A., A.B.L.S., assisted by Joan Etherington; 1954. London: J. and A. Churchill, Limited. 8½" x 5½", pp. 248, with 55 illustrations. Price: 25s.

This book, which is published for the Ciba Foundation, includes the papers read and reports the discussions at a symposium on "The Preservation of Normal Tissues for Transplantation", held in 1953. To this symposium were invited a "strictly limited" group of "leading research workers from different countries and different disciplines". Its authors are thus leading experts in their various fields, and the papers in fact cover a wider range than the title of the symposium would indicate; there is, for example, considerable discussion of the relative values, for clinical and experimental purposes, of autografts and homografts, and data on the development, in the individual life history, of the power to reject graft, and of the loss by the individual's tissues of the power to survive as a graft.

It is impossible, in a short review, to mention all the authors; but it may be said that, perhaps because of the limitations of the subject, the book makes more of a unity

than is usual in symposia; of course there is inevitably some overlapping. The book opens with a general discussion by Medawar, of the Department of Zoology at University College, London, on "General Problems of 'Immunity'" as they affect grafted tissues, especially skin homografts. He discusses in this connexion the general nature of the reaction to the presence of the graft (an "actively acquired immunity reaction"), such matters as the passive transfer of immunity, the methods for the prolongation of life of homografts, and the like. The majority of the papers are concerned directly with the technology of tissue grafting and preservation.

The following may be mentioned as examples of the subjects treated: general surgical problems of tissue plantation; transplantation of preserved non-viable tissues; the storage and preservation of blood, skin and nerve grafts, arteries and corneal grafts; and the tissue bank, its operation and management. There are also papers perhaps of a more academic character, but in each case dealing with matters which come very close to the surgeon's province, on "the behaviour of embryonic endocrine homografts", and on "long-term, large-scale tissue culture".

Each of the papers is followed by the verbatim report of a discussion which followed its presentation to the symposium; these reports will be found of particular value. There are also useful bibliographies.

This is a very valuable book because it includes within one cover a succinct account of the great and almost contemporary advances in knowledge in its important if rather specialized field.

Diencephalon: Autonomic and Extrapyramidal Functions. By Walter Rudolf Hess, M.D.; 1954. New York: Grune and Stratton. 9" × 5¾", pp. 92, with 33 illustrations. Price: $4.00.

THOSE familiar with the work of Professor Hess over the last thirty years may be disappointed with his brief first publication in English. However, it is intended only as an introduction to his more voluminous works. Throughout, the cat is used as the experimental subject and the introductory chapter on technique illustrates how well simple methods serve in the hands of a master. Hess rightly emphasizes the importance of not exhausting the animal by attempting too much, and his experimental findings are backed by a rigid anatomical check. The section on the autonomic function of the diencephalon endorses the now generally accepted view that the postero-inferior part, or hypothalamus proper, is concerned with mainly sympathetic motor responses which he calls ergotropic. The preoptic and supraoptic regions give responses of a more parasympathetic or defensive kind which he prefers to call endophylactic or trophotropic. The trophotropic responses are fairly well localized, but the ergotropic are diffuse, with considerable overlap. In addition, somatic motor activities, similar to those evoked by stimulation of the cerebral cortex, mid-brain or hind-brain, may be elicited from the diencephalon. These Hess includes under the not very useful term "extrapyramidal". On the other hand, he considers that autonomic responses associated with cortical conditions do not necessarily imply autonomic representation in the cerebral cortex but could be mediated by collaterals. This little book is well produced and illustrated, but the English is rather hard to follow at times. There is an extensive but highly specialized bibliography, mostly related to Hess's own school.

Clinical Chemistry in Practical Medicine. By C. P. Stewart, D.Sc. (Dunelm.), Ph.D. (Edinburgh), and D. M. Dunlop, B.A. (Oxon.), M.D., F.R.C.P. (Edinburgh), F.R.C.P. (London); Fourth Edition; 1954. Edinburgh and London: E. and S. Livingstone, Limited. 8¼" × 6", pp. 326, with 26 text figures. Price: 21s.

STEWART AND DUNLOP have given us a new edition (1954) of their valuable book "Clinical Chemistry in Practical Medicine". They are frank, and indeed wise, in their approach to modern scientific medicine—in their introduction they state: "A Generation ago, when the first edition of this book was written, we felt it necessary to begin with an Apologia for the place of Clinical Chemistry in Practical Medicine. To-day this is no longer necessary, and, far from needing to vindicate itself, biochemistry is in danger of being overemphasised in medicine to the detriment of careful history taking and bedside examination of the patient." Throughout the book the authors maintain that rational balance which we seek in the perfect physician, be he houseman, general practitioner or consultant. Thus they warn us that, although achlorhydria or pronounced hypochlorhydria is usual in carcinoma of the stomach, occasional cases are encountered in which a more generous secretion of hydrochloric acid is found—and there may be early cases which, if recognized, will be more amenable to surgery. On the other hand it is heartening to learn that the authors will not accept the diagnosis of pernicious anæmia in the presence of free hydrochloric acid.

A warning is sounded lest we await a pronounced fall in the chloride concentration in the cerebro-spinal fluid before making a diagnosis of tuberculous meningitis—admittedly the fall will eventually occur in an untreated case. In this fell disease no effort should be spared in the making of an early diagnosis, so that treatment may be most effective.

These are some of the many examples of the authors' splendid appreciation of the optimum balance which should pertain between bedside observation and the results of rational biochemical tests. Dr. Stewart and Professor Dunlop are to be congratulated on this recent edition. We commend it to all who strive to maintain a high standard of clinical medicine by keeping abreast with the recent advances in biochemistry and by placing it in its correct perspective.

Diseases of the Liver. By Mitchell A. Spellberg, M.D., F.A.C.P.; 1954. New York: Grune and Stratton, Incorporated. 11" × 8", pp. 656, with 93 illustrations, three in colour. Price: $16.50.

THE high incidence of morbidity occasioned by infectious hepatitis during World War II stimulated physicians, surgeons and biochemists to study diseases of the liver with renewed enthusiasm. During the past two decades considerable advances were made, not only in the biochemical tests for liver function, but in the employment of these tests to determine the ætiology of "hepatitis" in its broadest sense. Moreover, liver biopsy has been used on an increasing scale, and this has enabled a correlation to be established between clinical findings, biochemical tests and histological structure. This renaissance has been well described by Mitchell A. Spellberg, Associate Professor of Clinical Medicine in the University of Illinois School of Medicine, in his excellent book "Diseases of the Liver". After discussing the "clinical laboratory tests as mirror of hepatic function", Dr. Spellberg proceeds to tell us of the "morphological approach to diagnosis of liver disease" and includes an excellent chapter on the value and accuracy of liver biopsy. He emphasizes that liver biopsy may provide the final evidence for accurate diagnosis and prognosis, and may lead to successful treatment. The hazards are noted and the author is correct in stating that with increasing knowledge complications are becoming less frequent. He was able to collect from the literature records of 2944 biopsies performed between 1946 and 1952; there were seven deaths, several being those of otherwise "very ill patients". He gives an excellent chapter on infectious hepatitis, stressing the rare but sinister chronic form of this disease and its differentiation from chronic nutritional hepatitis and chronic external biliary obstruction. Most of the book refers to the work of American writers, but full credit is given to the studies of Himsworth, Sherlock and Sheldon in England and King, Downie and Doig in Australia. "Diseases of the Liver" is clearly written and well set out, and each chapter concludes with an excellent summary. The many illustrations and diagrams are clear and accurate and the bibliography is full and of great value. This is a most comprehensive text-book of liver disease which will be of great help to all particularly interested in diseases of the liver. Moreover, it should prove an excellent reference book to all seeking further knowledge in the course of their medical practice, and it is hoped that libraries throughout Australia will place it on their shelves for this purpose.

Methods of Biochemical Analysis. Edited by David Glick; 1954. New York: Interscience Publishers, Incorporated. Volume I. 9" × 6¼", pp. 532, with 67 illustrations. Price: $9.50.

THE current practice of "annual reviews" has now been applied to this important aspect of biochemistry under the leadership of an authority in the field of histochemistry. This volume begins a series to form "a collection of authoritative methods, procedures and techniques for the determination and assaying of biologically important substances and systems". The advisory board includes a number of men who have been pioneers in biochemical analysis.

This volume considers the following 17 topics: "Determination of Sulfhydryl Groups in Certain Biological Substances", "Analysis of Phenolic Compounds of Interest in Metabolism", "Microbiological Assay of Antibiotics", "Microbiological Assay of Vitamin B_{12}", "Chemical Determination of Ascorbic, Dehydroascorbic and Diketogulonic Acids", "Zone Electrophoresis", "Chromatographic Separation of the Steroids of the Adrenal Gland", "Analysis of Mixtures of Sugars by Paper and Cellulose Column Chromatography", "Chromatographic Analysis of Radioactive Iodine Compounds

from the Thyroid Gland and Body Fluids". "Chemical Estimation of Choline", "Estimation of Nucleic Acids", "Determination of Raffinose and Kestose in Plant Products", "Determination of ATP and Related Compounds; Firefly Luminescence and Other Methods", "The Assay of Catalases and Peroxidases", "The *in Vitro* Determination of Hyaluronidase", "Ultracentrifugal Analysis of Serum Lipoproteins", "The Assay of Urinary Neutral 17-Ketosteroids".

A number of these chapters are excellent and the general standard is high. These volumes will become required tools in any large analytical laboratory handling biological material. The arrangement of the material in each chapter is very clear, and the details of grades of reagents and the references to the original literature on each method are set out completely. At every point the book has been produced for most efficient use by the laboratory worker. This publication can be recommended highly for reference libraries used by biochemists in investigation or routine work.

Progress in Clinical Surgery. By various authors, edited by Rodney Smith, M.S., F.R.C.S.; 1954. London: J. and A. Churchill, Limited. 9½" × 6½", pp. 424, with 112 illustrations. Price: 36s.

THIS is a symposium edited by Rodney Smith, M.S., F.R.C.S., and contains a diverse series of surgical subjects, dealt with by British surgeons, each having a particular interest in the branch of surgery under discussion.

In general, the material is presented concisely, and under systematic headings. It is a much-welcomed attempt to present an up-to-date review of expanding surgical fields. The work includes an account of the management of carcinoma of the mouth and pharynx (Ronald W. Raven), the surgery of the œsophagus (R. H. Franklin), and the surgery of the stomach and duodenum (Ian Aird). Intestinal obstruction is dealt with by Rodney Smith, and there are several chapters on colonic surgery by E. G. Muir. An account of carcinoma of the breast is included by Victor Riddell. Other contributors present such expansive fields as peripheral vascular surgery, the surgery of the respiratory system, and modern developments in the surgery of the skull and its contents. Pancreatic surgery, portal hypertension, and sections on the treatment of thyrotoxicosis and hand lesions are also included.

With such a wide scope undertaken, this volume of some four hundred pages cannot often present appreciable detail, and it is emphasized that it can hope only to supplement, and not to replace, the standard text-books. As has been stated by the editor, the book has been produced in an attempt to assist the post-graduate student working for his final F.R.C.S. examination. In this it succeeds admirably. A comprehensive list of references is given on each subject, and the arrangement of headings is generally invaluable for examination purposes. This is a volume of considerable value in the preparation for the final F.R.C.S. examination, and one which provides a convenient revision for the practising surgeon.

Beyond the Germ Theory: The Roles of Deprivation and Stress in Health and Disease. Edited by Iago Galdston, M.D.; 1954. *New York: The New York Academy of* Medicine, published by the Health Education Council. 8½" × 5½", pp. 190, with 15 text figures. Price: $4.00.

THE discovery of vitamin deficiency disorders drew attention forcibly to the existence of diseases not arising from the invasion of germs. In the book "Beyond the Germ Theory" the results of psychic stress and emotional deficiency are presented by nine authors. The main thesis is that anger and fear, which subserve self-preservation, are inborn and unlearned, whereas the social emotions which hold society together are acquired, particularly in the family, and if not cultivated may fail to appear or undergo atrophy with grievous loss of civilization. Lack of such cultivation is seen in orphan institutions and amongst polyandrous Pacific islanders. The account given of the Israeli Kibbutzim will be new to many readers. Uncompensated emotional stresses can also endanger health and loosen the bonds of communal life and so imperil man's survival, which depends on social evolution or, better expressed, social adaptation. Especially to be commended are the chapters on the early history of scurvy and beriberi and on psychological experiments on sheep and goats. Two criticisms may be offered. "It is our opinion that the so-called toxæmias of pregnancy are in reality nutritional deficiency states." This assertion will not be supported by many gynæcologists. It is a pity that Claude Bernard's internal "milieu" should frequently be translated "internal environment", which suggests the stage Irishman; better the original expression or Cannon's homœostasis in its proper setting.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Diseases Affecting the Vulva", by Elizabeth Hunt, B.A., M.D., Ch.B. (Liverp.); Fourth Edition; 1954. London: Henry Kimpton. 10" × 6¼", pp. 236, with 64 illustrations, 17 in colour. Price: 31s. 6d.

Deals with vulval affections from the standpoint of a dermatologist.

"Prefrontal Leucotomy and Related Operations: Anatomical Aspects of Success and Failure", by Alfred Meyer, M.D. (Bonn), and Elizabeth Beck; 1954. Edinburgh: Oliver and Boyd. London: Macmillan and Company, Limited. 10" × 7¼", pp. 64, with 20 illustrations. Price: 10s. 6d.

This is Number XVII of the William Ramsay Henderson Trust Lectures.

"Pediatric Clinics of North America: Symposium on Care of the Premature Infant"; 1954. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical), Limited. 9" × 6", pp. 250, with 63 illustrations. Price: £6 *per annum*.

There is a foreword with fifteen articles on the premature infant. There are two contributions on other paediatric subjects.

"Surgery of the Caecum and Colon", by Stanley Aylett, M.B.E., M.B., B.S., B.Sc., F.R.C.S.; 1954. Edinburgh and London: E. and S. Livingstone, Limited. 10" × 7", pp. 302, with 142 illustrations. Price: 45s.

The author has paid particular attention to the step by step description of operative technique.

"The History of St. Mary's Hospital Medical School or A Century of Medical Education", by Zachary Cope; 1954. London: William Heinemann (Medical Books), Limited. 9" × 6", pp. 268, with 26 illustrations. Price: 25s.

A notable contribution to medical history.

"The Distribution of the Human Blood Groups", by A. E. Mourant, M.A., D.Phil., D.M. (Oxon.), with a foreword by H. J. Fleure, F.R.S.; 1954. Oxford: Blackwell Scientific Publications. 9" × 6", pp. 460, with four text figures and nine maps. Price: 42s.

Deals with all countries and has a bibliography of 1716 references.

"Blood Groups in Man", by R. R. Race, Ph.D. (Cambridge), M.R.C.S. (England), F.R.S., and Ruth Sanger, Ph.D. (London), B.Sc. (Sydney), with a foreword by Ronald Fisher, F.R.S.; Second edition; 1954. Oxford: Blackwell Scientific Publications. 8½" × 6", pp. 416, with 34 text figures. Price: 30s.

Each chapter of the first edition has been added to, and two new chapters have been written—on the *Kidd* groups and on linkage.

"Diseases of the Skin", by Oliver S. Ormsby, M.D., and Hamilton Montgomery, M.D.; Eighth Edition; 1954. Philadelphia: Lea and Febiger. Sydney: Angus and Robertson, Limited. 10" × 6¼", pp. 1504, with 768 illustrations, 18 in colour. Price: £11 16s. 6d.

The first edition was published in 1915.

"Fundamentals of Internal Medicine", by Wallace Mason Yater, A.B., M.D., M.S. (in med.), F.A.C.P., with the assistance of William Francis Oliver, B.S., M.D., A.A.C.P.; Fourth Edition; 1954. New York: Appleton-Century-Crofts, Incorporated. 10" × 7", pp. 1306, with about 150 illustrations. Price: $13.50.

There are 22 contributors; the book first appeared in 1938.

"The Care of Children: From One to Five", by John Gibbens, M.B. (Cambridge), M.R.C.P. (London); Fifth Edition; 1954. London: J. and A. Churchill, Limited. 7¼" × 5", pp. 214, with 10 illustrations. Price: 5s.

First produced in 1936.

The Medical Journal of Australia

SATURDAY, DECEMBER 4, 1954.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE PACE OF MODERN LIFE.

THAT we are living under a greater strain than ever before is widely accepted as an unchallengeable truth, but curiously no one takes the trouble to assess the magnitude of the evils we have surmounted in order to arrive at a net result. The rate of travel is accelerating continuously; our persons, letters and some urgently needed goods can pass over half the world's surface in a period of time which no one could have predicted a century ago, and no doubt many of our younger fellow citizens today will live to see the time reduced to as many hours as there are now days. Can we honestly accuse this high speed of travel of begetting body dangers greater than the benefits it unquestionably bestows? It is rather startling to think that Napoleon had no other means of transport at his disposal than were employed by Julius Cæsar, the rowing galley and the sailing ship on the water and the horse on land. The only improvements possible on land were to better the gradients and surfaces of the roads and the breed and nutrition of the horses. In the eighteenth century such improved conditions, coupled with a highly organized relay system, ushered in the era of the stage coach which aroused De Quincey's praise—"impression, for instance, of animal beauty and power, of rapid motion at that time unprecedented". There were many critics of the stage coach who looked askance at this, to them, unnatural velocity of travel in a wheeled vehicle; those who resorted too frequently to such contrivances developed, they said, nervous tremors, slept poorly and lost much of their hardihood. We smile now at this anxiety about a rate of movement which was, all told, about 13 miles an hour.

The outbreak of war in 1914 made British peoples realize that for a hundred years they had been living with no fear of armed invasion by a foreign and unscrupulous power. From the overthrow of Napoleon to the rise of German ambition to acquire world dominion, the English-speaking communities had enjoyed "fair weather sailing" and scouted as foolish the warnings of those who saw clearly what were the aims of Prussianism. Lord Roberts and Kipling were laughed at and economists demonstrated, at least to their own satisfaction, that war between Britain and Germany was impossible. Then came the horrors of unbridled warfare to be followed by a second explosion of German lust for power, shattering the complacency of the British Empire and America and putting the clock back to the thirteenth century when the bitter conflict between Frederick II of Hohenstauffen and the Papacy filled Europe with cruelty, spoliation and bloodshed. We are once more harassed by a fear which we thought had passed away, and we can now picture in part how fortunate and how happy we were before this bestial apparition of war enveloped us.

But what of the other fears? Surely we must admit that we are no longer heavily oppressed by these. Take, for example, pestilence. Wave after wave of bubonic plague, smallpox, leprosy, ergotism and other maladies swept over the known world. The infantile mortality was something we dare not think about. Longfellow could write in the middle of the nineteenth century:

> There is no flock, however watched and tended,
> But one dead lamb is there!
> There is no fireside howso'er defended
> But has one vacant chair.

Today we do not take a child's death so philosophically nor as so subject to inevitable fate. When pestilence struck a community the pulpits thundered with denunciations of the sins which brought disease as a well-merited chastisement. Today if poliomyelitis kills or cripples the child, if tuberculosis sends the adolescent into the grave or the sanatorium, if cancer robs the adult of existence just when the autumn of life should be pleasant, we do not speak with sad resignation of "mysterious dispensations of Providence"; we regard these calamities as proofs that our medical science is not as good as it ought to be, and our pathological research is whipped up into ever accelerating activity. The duration and expectancy of life are longer, the standard of health is on the up grade, and nutritional disorders are better understood and, amongst occidental peoples, declining in incidence.

Another fear which has gone from our lives is that of demons, witches, sorcerers and other powers of darkness. Someone acutely remarked that Australia is free from ghosts and we can accept this as a compliment. No longer is the cemetery a region of terror by night; no longer are parents upset by the possibility of the evil eye being cast upon their children. Burns's "Address to the Deil" shows how a hard-headed race like the Scots believed firmly in Satanic presence and cunning. Diseases are mostly ascribed to invasion of vegetable and animal parasites and not to invasion of devils. Gone, too, are dread of unjust laws and imposts; the taxes we resent are imposed upon us by our governments which are democratically elected. In 1215 and 1649 the tyranny of kings was rendered powerless; later ecclesiastical tyranny had its teeth drawn except in priest-ridden lands; the French Revolution put an end to the tyranny of aristocracies. This may all be true, say many today, but nevertheless the

tension of modern life is rapidly growing worse. It is very difficult to determine if this is really so.

> John Gilpin's spouse said to her dear:
> Though wedded we have been
> These twice ten tedious years, yet we
> No holiday have seen.

Twenty years without a holiday and poor John Gilpin lived over his shop and was at the beck and call of every customer, however small the purchase, or how hard each was to please. His hours of work were longer, his leisure was shorter than is the case today. Managers and directors could not spend Saturdays at any game. Calverley almost a century after Cowper could write:

> He stood, a worn-out city clerk . . .
> Who'd toil'd, and seen no holiday
> For forty years from dawn to dark.

Perhaps there is some exaggeration here, but the reference to the absence of a holiday is significant. Herbert Spencer, who died in 1903, was applauded for his aphorism that what occupies the leisure of life should occupy the leisure of education. We are now beginning to think that training for the proper use of leisure should with many citizens and particularly with manual workers be the paramount objective in scholastic discipline. The risks in economic life are less; the letters "Ltd." after the name of a firm indicate that our dread of crippling liability, should business reverses occur, has been removed. What then is the net result? It is very hard to arrive at an estimate. If we exclude the danger arising from a foreign and aggrandizing power, we may possibly regard our life today as happier than what was vouchsafed to our ancestors.

Current Comment.

SEVENTEENTH CENTURY FRANCE AND HARVEY'S "DE MOTU CORDIS".

THE great work of Harvey on the circulation of the blood (*"Exercitatio anatomica de motu cordis et sanguinis in animalibus"*, first published at Frankfort in 1628) no longer gives rise to violent arguments. However, like all uncomfortable discoveries that cut across accepted opinions, it early aroused considerable opposition in some quarters. In France it became the centre of a very curious situation, and this small piece of French history has been admirably recounted by L. Chauvois.[1] The relevant period was from 1671 to 1690; on the throne was Louis XIV, *le roi-soleil*; and the greatest literary figures of the *grand siècle* espoused the cause of Harvey in opposition to the official teaching of all the medical faculties, that of Paris being in the front rank.

The idea that the blood circulated continuously throughout the organism had been put forward by Descartes in his "Discourse on Method" (1636) and other writings, and was beginning to be accepted by *"le haut public cultivé"*. Descartes agreed with Harvey's description of the circulation, except for what Chauvois regards as the best of Harvey's discoveries—the emptying of the heart in systole and its filling in diastole. On that point Descartes was either reticent or frankly hostile. In a letter to Father Mersenne in 1632 Descartes wrote as follows:

> I have read the book *De motu cordis* about which you spoke to me some time ago and find myself differing little from his opinion, although I did not see it until after I had finished writing on the subject.

The first of the great literary figures on the scene was Molière, the actor and dramatist, who is to France what Shakespeare is to England. On February 10, 1673, there took place at his own theatre the first performance of his play *Le malade imaginaire*, the point of a few lines from which is obvious. The senseless Diafoirus, speaking of his simpleton of a son, says:

> . . . But above all, the thing which pleases me about him, and in which he follows my example, is that he holds blindly to the opinions of the ancients, and that he has never shown any inclination to understand or even to listen to the arguments and experiments in favour of the discoveries claimed for our century concerning the circulation of the blood and other opinions of the same stamp.

(*Le malade imaginaire* was Molière's last and possibly his greatest play. He was seriously ill while he was finishing writing it, and by insisting on continuing to perform in it "in order not to deprive his associates of their livelihood", he brought about his own death. This took place on the night of the fourth performance, February 17. However, this is by the way.)

The second writer to enter the arena was Boileau, who in 1675 published a scathing criticism of the "anti-circulationists" in the form of a "Burlesque Judgement of the Full Court in favour of masters of arts, doctors, professors at the University of Stagira, Chimeria, to uphold the doctrine of Aristotle". He called upon the public prosecutor to take action against "the said Reason for having discovered in the heart the function of causing the blood to travel all over the body, the said blood having absolute power to roam, wander and circulate without let or hindrance through the veins and arteries". Against this the court issued a burlesque order forbidding the blood "any longer to roam, wander and circulate in the body on pain of being summarily handed over and abandoned to the Faculty of Medicine". This was the type of satire that Boileau could handle supremely well. Pope owed much to him in his "Essay on Criticism", and indirectly through Dryden and Pope, Boileau had a considerable effect on English literature.

Harvey's third literary supporter was La Fontaine. In 1682, in one of his little known poems, which appears only in rare editions of his works (and scarcely adds to the esteem in which he is held), La Fontaine described shortly the circulation of the blood and so took his stand as a "circulationist". This poem was written to help reinstate in the favour of the king the Duchess of Bouillon, one of the youngest of Mazarin's nieces, who, suspected of being implicated in an attempt to poison Louis, had been banished to Nérac. The subject was *"Le quinquina"*, and the poem praised a health powder with cinchona as its base. Louis in 1679 had shown himself keenly interested in this by purchasing the secret from an English knight, one Talbot, for the sum of £40,000 with a pension of £2000 per year. La Fontaine began his poem with a short lesson in anatomy and physiology, in order to be able to explain the effects of cinchona; in a few lines he showed clearly that he was a "circulationist", and even went a little further than Harvey on some points, notably in the importance he attributed to the chyle. La Fontaine's works fall naturally into three divisions, the fables, the tales, and a miscellaneous group. It has been said that the first are universally known, the second are known to all lovers of French literature, and the third are all but forgotten; this "circulationist" poem undoubtedly belongs to the third group.

One naturally wonders what brought about this strange interest of literary men in a medical problem. The answer lies in the period, and in the personality of *le roi-soleil*, who, it will be remembered, was a forceful man not taking kindly to opposition. As early as 1671 Louis, apparently influenced by more liberally minded medical counsellors than the faculties of medicine, decided to revive the independent chair of anatomy in the King's Garden, with the object of teaching the new anatomy there. He therefore issued a decree announcing its reestablishment. This chair had originally been set up by Louis XIII in 1635 for the teaching of chemistry, and had been strenuously opposed by the official Faculty of Medicine, as usurping its prerogatives. The faculty had gained its point in Parliament, and the chair had been suppressed several years

[1] *Presse méd.*, September 11, 1954.

earlier. Once more, in 1672, the opposition brought the matter before Parliament; but Louis XIV was not to be intimidated, and went in person to inform the House of his wishes. He got his way, and appointed Pierre Dionis to the position of professor. Dionis's lectures, with the title of "The Anatomy of Man according to the Circulation of the Blood and the Latest Discoveries", were first published in 1690, and a short passage from his preface is of interest:

> His Present Majesty, in the month of March of the year 1673, commanded that Demonstrations of Anatomy and Operations of Surgery should be performed in the Royal Garden with open gates, and without charge, in a Lecture Room which he had had constructed for that purpose; and that the subjects necessary for these demonstrations, should be sent to his Professors in preference to all others.

Thus in 1671 and 1672 the disturbance made by the establishment of this royal chair of anatomy and its teaching naturally attracted the attention of Molière, always on the lookout for current events, to be used as a spicy seasoning for his plays. Two years later Boileau, the staunch friend of Molière, who had possibly attended demonstrations and lectures at the royal chair of anatomy, produced his burlesque law suit. Finally La Fontaine, in 1682, gives the impression of having really taken the courses in the new anatomy in the King's Garden, so exactly does the description of the circulation given by him correspond with the teachings of Dionis.

FOOTWEAR AND SKIN AFFECTIONS OF THE FEET.

FOOTWEAR has been repeatedly cited as the cause of various affections of the skin of the feet, but the extent of its importance is not always realized. An examination of the reasons for admission of skin patients to a large Veterans Administration Hospital in New York revealed to Harry Shatin and Milton Reisch[1] that of over 2000 admissions 1·9% were for dermatitis venenata of the feet due to shoes. This led them to a more detailed examination of their material, which is of considerable interest, but is unfortunately not representative, all the subjects being adult males. It was found difficult to establish a definite pattern of sensitivity. Positive reactions were obtained from patch tests performed with various parts of the patient's shoes. Shoe lining leather, inner sole, heel pad and other parts of the shoe were capable of producing positive skin reactions on patch testing. In any one patient there were noted positive reactions to a single substance or to a group of substances. However, there appeared to be no common antigenic agent amongst the various substances producing positive patch test reactions in any one individual. In favour of the clinical diagnosis of "shoe dermatitis" were the appearance of dermatitis, exacerbations coinciding with the wearing of shoes, and remissions apparently induced merely by removing the shoes. Most patients had dermatitis on the antero-dorsal portion of the foot which usually started on the dorsum of the great toe as mild erythema with scaling, gradually became vesiculated and at the same time showed a tendency to involve the backs of the adjoining toes. In some cases the rash spread to the distal half of the dorsum of the foot, in other cases it spread to the interdigital surfaces, and in a few cases it spread to the plantar surfaces. Some patients had pruritic localized lesions on the heels with erythema and vesiculation. Cellulitis and lymphadenitis sometimes occurred. Id-like eruptions were seen on the hands and forearms with vesicles on the palms and sides of the fingers. In some cases dermatophytoses and contact dermatitis were apparently active in the same patient. After further investigation the thermoplastic toe of the shoe was shown to be the factor in the majority of cases. Apparently rubber, the essential ingredient in the thermoplastic material, was the actual offender. It is pointed out that the antioxidants and accelerators in rubber are actually the basic sensitizers. Cure of the dermatitis was readily effected by the substitution of a shoe with a flannel box toe for the thermoplastic box toe.

Evidence put forward by R. C. Carney in another article in the same journal indicates that "Nylon" fabrics may be an important factor in the production and prolongation of skin diseases, notably in persons with vasospastic disease of the feet. Carney states that "Nylon" has been implicated in the ætiology of dermatoses because of sensitization of the skin to dyes and fabric finishes used in the manufacture of "Nylon" garments. In his personal experience, lesions of the "pernio type" have been produced and reproduced by contact with "Nylon" cloth, probably because of its lack of absorbency. Experience indicates that the wearing of "Nylon" hosiery or hosiery with "Nylon" reinforcement in the toes and heels may precipitate or contribute to a pernio-like vasospastic disease of the feet characterized by redness, swelling, hyperidrosis and the development of tender, burning, white œdematous patches on and about the soles. This appears to be due to the lack of absorbency of "Nylon" and suggests the possibility that "Nylon" fabrics may promote or contribute to other disorders in which sweating and moisture are factors. In four cases mentioned by Carney patients affected with the disturbance of the feet described have since experienced good relief from the avoidance of "Nylon" footwear. An interesting point is that where the tender white patches lie against the canvas or leather lining of the shoe about and beneath the heel, the lining disintegrates rapidly. The diagnosis is apparent from the shoe before the patient takes his socks off.

[1] *Arch. Dermat. & Syph.*, June, 1954.

"LA MÉLOTHÉRAPIE."

MOST people will be willing to agree that music has healing qualities, the exceptions being those like Emerson who, having no ear for music, thought that all performers at a concert were crazy and all the audience making-believe crazy, "in order to soothe the lunatics and keep them amused". John Armstrong, the English poet, physician and essayist, who flourished in the eighteenth century, summed up his own opinion in the following lines from his "Art of Preserving Health":

> Music exalts each joy, allays each grief.
> Expels diseases, softens every pain,
> Subdues the rage of poison, and the plague.

In a leading article in this journal on "Music and Personality",[1] we remarked that "music is today part of the environment of the physically and mentally ailing". Further attention has been drawn to the subject in a short article entitled "*La musique et la médecine: la mélothérapie*", by Roger Vaultier.[2] There is no exact translation into English for the word "*mélothérapie*", which looks as if it has been neatly coined for the occasion; but its meaning is obvious. Vaultier briefly refers to various opinions on and examples of the therapeutic use of music in France from the fourteenth century onwards. By far the most startling story he has to tell is that of a case of restoration to life of a dead person by music alone. We shall retell the story in English, in as nearly literal a translation as possible of Vaultier's delightful French.

In the year 1786, the monastery of the Récollets in the little town of Châteaudun, the capital of Dunois, had only a few monks. However, amongst them was Father Victor Bénard, former superior and master of the novices, who was much loved and well known in the district. Everyone liked to hear him play the organ. One day he took to his bed; the doctor diagnosed "*une maladie aiguë, spasmodico-nerveuse avec des symptômes fréquents*". Such was the opinion of Dr. Destrées, who ten days later found his patient in a very bad way in spite of energetic treatment. Nevertheless, he was astounded, at his next visit to the monastery, to find that Father Bénard had died after a violent nervous attack, and that his body had been placed in the choir of the church, his face uncovered

[1] M. J. AUSTRALIA, August 30, 1947.
[2] *Presse méd.*, August 28, 1954.

according to custom. Dr. Destrées could not believe his eyes. He examined the body, thought deeply, and hurried off to see the major of the garrison. (At that time the Orleans Dragoons were stationed at Châteaudun.) Dr. Destrées asked for the band; and an hour later there were in the Church of the Récollets fifteen soldiers with their musical instruments. They proceeded to play a variety of pieces, ranging from sweet melodies to the liveliest airs. During all this the monks prayed for their brother and the doctor examined his patient. At the fourth piece, Father Bénard's features seemed to relax a little. Dr. Destrées rubbed his face with alcohol and perfumes. They then carried the body into the infirmary, and the doctor sent for a distinguished violinist; the leader of the Dragoons also took up a violin, and before a little group composed of the dean of the monastery, the musicians, the doctor and his dog, the melodious treatment went on. According to Lecocq, who originally recorded the story, tarentellas of lightning-like rapidity were followed by jigs, gavottes, minuets and the most enticing of waltzes (Vaultier remarks that the report of the waltzes is certainly untrue). Whilst this musical delirium progressed *crescendo*, Dr. Destrées constantly rubbed the face of the monk with spirits, then he gave him a few spoonfuls of Spanish wine. Finally, Father Victor opened his eyes and stammered a few words, during which procedure a monk danced with the doctor's dog. After this Dr. Destrées continued to care for his restored patient, who, after violent sweats and an eruption, was up and about after two days. Father Bénard recorded his adventure in the *Affiches chartraines*, which Vaultier describes as an exceedingly rare journal, the complete series of which seems to have been destroyed in the great fires of the Liberation. Vaultier points out that this was a great loss to the history of medicine, since the journal had published papers of the first importance. A drawing of the band playing Father Bénard back to life was made by a popular artist, and is reproduced by Vaultier. On seeing seven of the fifteen bandsmen blowing their wind instruments with might and main, we cannot feel surprise that Father Bénard preferred life to death under such conditions.

MEDICAL TREATMENT OF ESSENTIAL HYPERTENSION.

ESSENTIAL HYPERTENSION is a very common condition, and numerous methods have been used in its treatment with only fairly satisfactory results. In the past two years the number of drugs used in this way have multiplied, and there are now perhaps twenty preparations which are more or less effective in reduction of blood pressure. Advertisements for proprietary preparations commonly indicate that the treatment of essential hypertension is easy; actually it is often complicated and difficult. In an outline of their experiences at the Mayo Clinic with several of the more effective drugs, E. V. Allen *et alii*[1] point out that several basic points should be kept in mind in the medical treatment of essential hypertension. Almost every drug used has effects other than those on blood pressure. These effects may be minimal to severe, transient to persistent. The effectiveness of any drug in the reduction of blood pressure cannot be predicted. Frequently more than one basic preparation must be used to reduce blood pressure adequately. When there is urgent need to reduce pressure, it seems best to begin treatment with more than one drug, as, for example, with hexamethonium and hydralazine ("Apresoline"). Treatment with hexamethonium and pentapyrrolidinium should be initiated in hospital. The patient must learn to determine and record his own blood pressure and to regulate dosage, and control must be continued outside hospital. The essential of good treatment is reduction of blood pressure without serious complications. Too often inadequate amounts of drugs are given without satisfactory reduction of pressure. Hydralazine ("Apresoline") hydrochloride is a compound which apears to reduce blood pressure by its central action at the hypothalamic level and by inactivating certain pressor substances in the blood. It is not a potent antihypertensive drug, and the response may not become evident for a period ranging from a few days to several weeks. Side effects are common. Some of the immediate ones are headache, which may be mild to severe, tachycardia, shortness of breath, paraesthesias of the extremities, nervousness, dry mouth, anxiety and depression. A syndrome very like rheumatoid arthritis may occur after some weeks' treatment, also other manifestations of collagen disease. Some of these effects disappear with continued treatment, others can be controlled by appropriate medication. Better results are obtained by using hydralazine with one of the other antihypertensive drugs.

Potassium thiocyanate has been used for a number of years in the treatment of hypertension. In moderate cases and in some severe cases it lowered the blood pressure definitely and safely and relieved symptoms such as headache, vertigo and nervous tension. The necessity of frequent determinations of blood cyanate levels to control the dosage and the occasional toxic effects caused gradual lessening of its use. According to Allen and his colleagues, thiocyanates still have a place in treatment, particularly in young patients with hypertension and severe migraine. In these cases hydralazine increases the migraine attacks.

Hexamethonium is a ganglionic blocking agent, the effect of which lasts for several hours after each dose. It is a potent antihypertensive drug. It may be given either subcutaneously or orally, and the dose required by either method has to be established by trial; hence the necessity for careful hospital control. Before the patient leaves hospital he must obtain a hypodermic outfit and a sphygmomanometer and be carefully trained to measure the dose of hexamethonium to be given according to the systolic blood pressure. Untoward side reactions consist of blurring of vision, orthostatic weakness and lightheadedness, and occasionally syncope on assuming the upright position. Many patients have constipation and flatulence, and paralytic ileus may occur, but this disappears when administration of the drug is stopped. Hexamethonium therapy is rather cumbersome, somewhat costly, requires training and supervision, and is not without risk of disagreeable and even alarming side effects. Allen *et alii* reserve it for the more severe types of essential hypertension in which the disease seems progressive. Usually they give it with hydralazine or one of the preparations of *Rauwolfia serpentina*; for in most cases the combination is more effective.

Pentapyrrolidinium bitartrate is one of the newest of the hypotensive drugs. It is effective in smaller doses than hexamethonium, but has similar side effects. It has advantages over hexamethonium in some cases, but these are not great. It might be useful used alternately with hexamethonium.

Veratrum viride has been used for many years in the treatment of hypertension. A number of preparations of the alkaloids of *Veratrum viride* are on the market, but little can be said as to the relative value of the different preparations. The drugs have a vasodepressor and bradycrotic effect. Epigastric burning may result, also nausea, vomiting, bradycardia and circulatory collapse. The bradycardia can be abolished by administration of atropine without affecting the hypotensive action. *Veratrum viride* preparations are palliative and not curative in the treatment of essential hypertension. The range between hypotensive and undesirable effects of *Veratrum viride* may be very narrow, and it is not a very satisfactory drug.

Rauwolfia serpentina has been in use outside of India for the past five years; only recently have preparations of it appeared on the market, but much work has been done on its effect in essential hypertension. The preparations are safe and easy to administer, and troublesome side effects are infrequent. To date no serious untoward reactions have been noted. It is, however, not a potent hypotensive agent. It is most effective in treatment in mild, labile cases and not so effective in severe cases. When it is effective the reduction of blood pressure is

[1] Proc. *Staff Meetings Mayo Clin.*, August 25, 1954.

gradual and smooth. In the more severe cases it can be given effectively with one of the other hypotensive drugs.

The use of more than one basic preparation at a time has many advantages, not the least being the reduction in side effects because of the smaller dosage of each drug. It is clear that none of the drugs mentioned is entirely satisfactory in the treatment of essential hypertension, but good results can be obtained in many cases by careful control of dosage. Predictability of effectiveness of a programme of treatment, either with a single drug or with a combination, is of a very low order, and the cost of modern hypotensive drugs is considerable.

WILLIAM CLIFT AND THE HUNTERIAN COLLECTION.

MANY colourful and illuminating biographies have been written of great men of science; it is somewhat unorthodox, however, for a writer to think of publishing a book about a self-effacing and humble individual who, throughout his whole career, was little more than a hired servant to great men of science. In her recently published biography of William Clift, F.R.S., the loyal and devoted laboratory assistant of Dr. John Hunter, Miss Jessie Dobson,[1] has succeeded admirably in giving vivid impressions of the fine character and specialized gifts of her subject, and in widening our perspective of the new surgery and its early exponents.

This fascinating book, published for the Royal College of Surgeons out of the Macrae-Webb-Johnson Fund, opens at the beginning of the last quarter of the eighteenth century with the Clifts and their family of seven children struggling against a lopsided economic system to maintain life and respectability in the small Cornish village of Burcombe, near Bodmin. The youngest son, William, was obliged to leave school at a tender age in order to earn fourpence a day in the local nursery garden. But the prevailing poverty, ignorance, and other social injustices could not prevent the boy from taking advantage of a natural bent for draughtsmanship and calligraphy; and it was on account of his promising efforts in these accomplishments that a kindly patron used her influence to have the honest lad apprenticed to Dr. John Hunter at No. 28 Leicester Square, London. The great surgeon-naturalist took a fatherly interest in young Clift, provided for him a good drawing master, taught him the first principles of accuracy, method and scientific integrity in museum work, and gave him new prospects of contentment and security in a comfortable home environment. After Hunter's death in October, 1793, the whole responsibility devolved upon Clift for the care and maintenance of the rare natural history collection of 17,000 specimens. Miss Dobson writes: "It was, in truth, John Hunter's great unwritten book and it must always be remembered that had it not been for William Clift, its pages would never have been made available to future generations."

Many readers will be familiar with the history of the Hunterian Collection after its purchase by the Government in 1799, and its subsequent removal to the care of the Royal College of Surgeons at Lincoln's Inn Fields. But Miss Dobson's careful research throws more light on the scientific importance of Hunter's vast labours, and the devoted efforts of the first conservator of the museum to make an intelligent display of the collection and to interpret its true meaning for the benefit of receptive minds. Also, there are many interesting sidelights on the medical life of the period, the introductory activities of the Royal College of Surgeons, and the perfidy of its first President, Sir Everard Home, in plagiarizing from Hunter's unpublished manuscripts to further his own scientific ends.

This small book, which is provided with many unusual and interesting illustrations, has more to convey than just entertaining historical facts; it has a message for all keen practitioners of medicine, and many will be better practitioners for reading it. The story of William Clift's essential part in the preservation of the great Hunterian Collection comes opportunely at a time when we are marking with honour the death of a distinguished honorary curator of the Collection, Frederic Wood Jones.

[1] "William Clift", by Jessie Dobson, B.A., M.Sc.; 1954. London: William Heinemann (Medical Books), Limited. 9" x 6", pp. 152, with 32 illustrations. Price: 21s.

ADULT PREMENSTRUAL ACNE.

THE association of *acne vulgaris* with the endocrine system is generally admitted, but the specific nature of the association in individual cases or in particular types of acne has proved difficult to determine. This uncertainty is reflected in the widely differing views put forward on hormone therapy. It may be that some progress towards understanding the situation is to be seen in a recent description by B. A. Newman and J. F. Feldman[1] of an entity suggesting *corpus luteum* dysfunction to which they have given the title "adult premenstrual acne". From their study of a group of adult female patients with recalcitrant acne, which presented a characteristic clinical picture and a specific response to progesterone, these investigators feel that they have differentiated a clinical variety of acne of a specific endocrinological type. They list cases into three main groups. The feature common to all three groups is acne which makes its appearance in adult women between the age of twenty years and the menopause. The lesions are confined to the face and may make their appearance at any time during a two-week period preceding the onset of menstruation. However, the eruption characteristically appears within ten days prior to the onset of the menstrual flow. The eruption consists of firm, painless, erythematous, dome-shaped, discrete papules, papulo-nodules or nodules, which occasionally become cystic. They develop without a preexisting comedo. The lesions require three or four days for their evolution. Generally only two or three lesions appear prior to one menstrual period. The lesions involute spontaneously by resorption in three weeks. Healing occurs without scarring. The commonest sites involved are the chin, the sides of the face and between the eyebrows. The patients in this group study can be divided into three main groups: (i) Those in whom premenstrual papules, nodules and/or cysts begin for the first time in adult life. (ii) Those in whom the "premenstrual type" of lesion and the usual comedones of *acne vulgaris* begin concomitantly in adult life; there is no history of acne during the adolescent period. (iii) Those in whom *acne vulgaris* begins during adolescence and persists into adult life, through the early or mid-twenties. During this latter period the "premenstrual type" of lesion makes its appearance and persists, even though the comedo acne has disappeared with or without treatment.

The treatment used for the control of the entity described was the administration of progesterone. A dose of ten milligrammes of progesterone was injected intragluteally ten days before the onset of menstruation, and a dose of five milligrammes was repeated five days before the menstrual period. If the injections inhibited the formation of the premenstrual lesions, ten-milligramme progesterone buccal tablets were used daily for ten days preceding the menses. The tablets were not as consistently effective as the injections, and on occasions it was necessary to return to the intramuscular route. Progesterone was effective in preventing or controlling the condition the authors have termed "adult premenstrual acne" in the majority of cases. Therapy with progesterone varied in duration from five to twenty months. If therapy was discontinued, there was often a relapse. Of 95 patients, 12 showed no evidence of relapse after treatment was discontinued. The longest interval of freedom from lesions in any patient after cessation of treatment with progesterone was fourteen months. In four cases, relapse was noted approximately one year after hormonal treatment was curtailed. Among Newman and Feldman's patients, a spontaneous remission of this type of acne occurred in five women during pregnancy, only to recur within several months after term.

[1] *Arch. Dermat. & Syph.*, March, 1954.

Abstracts from Medical Literature.

RADIOLOGY.

Incidence and Significance of Placental Calcification.

J. BLAIR HARTLEY (*Brit. J. Radiol.*, July, 1954) discusses soft tissue placentography in general and emphasizes the value of radiographic demonstration of placental calcification. He shows the incidence of placental calcification antenatally after the thirty-second week and compares it with that occurring in placentæ (from 252 consecutive cases of thirty-six weeks or more) examined radiologically at birth. The relative value of more elaborate methods of assessing placental site (such as aortography, retrograde catheterization of the femoral artery and use of radioactive isotopes) is stated. The author considers that they pale into insignificance compared with first-class soft-tissue radiography with the low-kilovoltage technique. He states that if placental calcification of gross and of medium degrees only can be identified routinely, this can enable the radiological "diagnosis" of the placental site and extent to be correct in 98% of those cases (after thirty-two weeks) in which this is asked for or required.

Inspiratory Widening of the Heart Shadow.

J. MUNK AND K. T. LEDERER (*Brit. J. Radiol.*, May, 1954) state that inspiratory widening of the heart shadow was found to be a constant fluoroscopic sign in cases of acute laryngo-tracheitis with inspiratory impairment. This sign was also observed in other cases of respiratory obstruction causing inspiratory impairment. In some cases of upper respiratory obstruction with predominantly expiratory impairment, expiratory narrowing of the heart shadow was observed. The mechanism of these changes in heart size on fluoroscopy and their diagnostic value are discussed.

Correlation of the Clinical, Pathological and Radiological Findings in Diverticulitis.

ALEXANDER GOULARD, JUNIOR, AND AUBREY O. HAMPTON (*Am. J. Roentgenol.*, August, 1954) state that the gross pathological result of a single or of repeated episodes of inflammation with diverticula is a characteristic distortion of the bowel. The bowel is shortened as a result of fixation of inflamed diverticula in the wall or mesentery. With subsequent fibrosis, the bowel wall is thrown into numerous folds, bunched closely together. This accordeon-like approximation of the folds is greatest on the mesenteric side, the area where diverticula are most prone to occur, although they are also found on the anti-mesenteric side. The physiological result is limited contraction and expansion, particularly in a longitudinal direction. The changes are permanent, are the result of chronic disease and do not necessarily indicate persistent acute inflammation. The interfold spaces (haustra), if sufficiently narrow, when filled with barium present the so-called "saw tooth deformity" consisting of sharply pointed spikes of barium. This deformity has previously been interpreted as evidence of acute inflammation or of a prediverticular stage of diverticulosis, but in reality is neither. The true "saw tooth deformity" is a permanent result of inflammation and fibrosis. It can be determined accurately only with maximum distension, as the folds normally approximate one another when the bowel is contracted. Occasionally the partially filled neck of a diverticulum will simulate a "saw tooth", but these necks are blunted where the barium is beginning to spill into the sac of the diverticulum, and are distinctly different from the sharp spikes made by the interfold spaces of the shortened colon. It has been stated that perforation of a diverticulum with abscess formation is rare. The authors believe that the case is exactly the reverse, and that acute diverticulitis results from a perforated diverticulum with cellulitis and abscess formation even though the abscesses may be quite small. It has not been possible to predict from the clinical signs and symptoms, or from the length of illness, which patients will demonstrate abscesses or how they will be demonstrated, except that there is uniformly an association of dysuria with large abscesses. Localized tenderness and the demonstration of abscesses, 60% by fluoroscopy and skiagrams as opposed to 26% clinically palpated, are the most reliable X-ray signs of acute diverticulitis. There were no serious complications to filling the abscesses with barium.

Cleido-Cranial Dysostosis with Osteopetrosis.

L. GIACCAI, MARIA SALAAM AND H. ZELLWEGER (*Acta radiol.*, May, 1954) report a case in which were present the following changes typical of cleido-cranial dysostosis: defective ossification of the cranial plates with persistence of wide membranous gaps at the site of the sutures and numerous wormian bones, dental abnormalities with persistence of the deciduous dentition, developmental defect of the clavicles, dysplasia of the phalangeal bones and hypoplasia of the maxilla and mandible. The authors state that, on the other hand, another group of findings is characteristic of osteopetrosis: systemic bone sclerosis, brittle bones with multiple transverse fractures, spool-shaped vertebral bodies with condensed epiphyseal plates and persistence of wide vascular channels, and aplasia of the paranasal sinuses and the mastoids. On the whole, however, the characteristic changes of cleido-cranial dysostosis greatly predominate over those of osteopetrosis. In addition, severe mental deficiency with psychotic features was found. From an analysis of this case and of similar cases reported in the literature, the authors conclude that a connexion more than fortuitous exists between cleido-cranial dysostosis and diffuse osteosclerosis, or at least that there is an osteosclerotic type of cleido-cranial dysostosis which so far has not been described. The authors state that the aetiology of both cleido-cranial dysostosis and osteopetrosis is unknown. There is good evidence, however, that the cause of both defects lies in an early developmental aberration of the mesenchyma, beginning in the first weeks of embryonic life. Congenital abnormalities of the skeleton are often found associated with a great variety of combinations resulting from different and multiple ways in which the same unknown hereditary or acquired factor may affect the bone-forming blastema. The hypothesis seems justified that in the present case, as in the other reported observations, cleido-cranial dysostosis and osteosclerosis may be due to a common aetiological factor responsible for a two-directional derangement in the developmental process of the mesenchyma.

Angiocardiography and Assessment of the Operability of Bronchial Cancer.

B. V. SLESSER *et alii* (*Thorax*, June, 1954) discuss the value of angiocardiography in assessing the operability or otherwise of bronchial cancer in the light of their results in 31 patients, whose tumours were all regarded as operable on clinical grounds. Twenty patients showed no deformity of the pulmonary artery or superior *vena cava*, and the condition was considered operable: this was confirmed at thoracotomy. Eleven patients showed deformity of the vessels mentioned, and in every case the tumours were found to be inoperable.

PHYSICAL THERAPY.

Progressive Exophthalmos after Thyroidectomy Cured by Irradiation of Cerebral Centres.

A. T. BERKMAN (*Radiology*, March, 1954) states that although a relationship exists between exophthalmos and thyroid activity, treatment of the hyperfunctioning gland is frequently without any effect upon the exophthalmos, and in some cases this may continue to progress after treatment of the primary disease. Irradiation of the pituitary for exophthalmos has been reported by several authors to give good results, and this is a report of a case so treated. It is postulated that the pituitary produces an exophthalmos-stimulating hormone as well as a thyrotropic hormone and that suppression of this hormone can be obtained by irradiation. In this case the patient had shown progressive exophthalmos for over two years after thyroidectomy. Irradiation of the hypophyseal hypothalamic region was carried out through three fields, each field being treated once a week to a total dose of 800*r*. The exophthalmos diminished rapidly during treatment and was gone one month after completion of the course.

The Superior Vena Cava Obstruction Syndrome in Bronchogenic Carcinoma.

B. ROSWIT, G. KAPLAN AND H. G. JACOBSON (*Radiology*, November, 1953) state that the onset of superior *vena cava* obstruction in a patient with bronchogenic carcinoma is a serious event producing severe discomfort, and unless treatment is promptly and effectively instituted, the

course is rapidly progressive. They review a series of 38 cases in which X-ray therapy and/or nitrogen mustard therapy produced good palliation. A description is given of the anatomical and physiological factors concerned in the production of this syndrome. X-ray therapy was given to 20 patients, the tumour dose varying from 1000*r* to 5000*r*. The authors consider that a dose of 3500*r* to 4500*r* should be given whenever possible in order to obtain the maximum remission. Eight patients were treated with nitrogen mustard. Of those patients treated by irradiation a satisfactory response was noted in 75% with an average remission of fourteen weeks. The maximum remission was over a year, and six patients were relieved for over six months. With nitrogen mustard 80% of patients showed improvement; the average remission period was seven weeks, and the longest about eighteen weeks. Remissions were characterized by relief of respiratory distress, pain, cough and cyanosis, often within forty-eight hours, and occurred more quickly with nitrogen mustard than with irradiation. The authors are of the opinion, however, that X-ray therapy is the method of choice whenever possible, as occasional long-term remissions can be obtained. Nitrogen mustard should be reserved for those cases in which the patients have failed to respond to irradiation, or in which irradiation is not possible.

MEDICINE.

Aging of the Stomach.

EDDY D. PALMER (*J. Am. Geriatrics Soc.*, March, 1954) examined biopsy material from the gastric mucosa of 30 persons more than sixty years of age who complained of no gastric symptoms. The specimens were no different from the gastric mucosa of young subjects. The author concludes that there is no evidence to support the view that mucosal atrophy or any other change is a normal consequence of aging.

Vascular Damage and Pregnancy Toxæmia.

F. A. FINNERTY (*J.A.M.A.*, March 27, 1954) reviews 303 cases from a pregnancy toxæmia clinic. The diagnoses were as follows: hypertensive vascular disease, 216; hypertensive vascular disease *plus* toxæmia, 28; post-partum hypertension, 14; true toxæmia, 45. Emphasis is laid on the appearance of the retina in true toxæmia of pregnancy. The retinal vessels are entirely normal but show segmental vasospasm. There is no increase in the arterial stripe, no tortuosity and no arterio-venous nicking. The entire retina has a wet, glistening appearance as if covered by a thin film of fluid. Because of a pronounced sheen the examiner has difficulty in clearly outlining the retinal vessels. The many reflections of lights on a wet street at night resemble this phenomenon. The appearance of the retina, the state of the vessels elsewhere and the level of the blood pressure allow distinction to be made between the different groups enumerated. Examination of the retina in 25 members of the true toxæmic group, six weeks *post partum*, revealed no abnormality. In 20 patients, however, in spite of the return of blood pressure to normal and the disappearance of albuminuria, definite retinopathy was present. These changes are attributed to the duration of the toxæmia rather than to its severity. The average duration of the toxæmic process in the group with persistent retinal changes was 6·2 weeks and in the other group was 2·4 weeks. It is suggested that if toxæmia is allowed to continue beyond a critical period (more than one month), persistent vascular damage may occur.

Pathogenesis of Essential Hypertension.

J. E. WAKELIN (*Arch. Int. Med.*, December, 1953) discusses the pathogenesis of essential hypertension. He states that essential hypertension accounts for 95% of cases of hypertension and the remaining 5% are composed of hypertensions of known (even though incompletely understood) causes. In this latter group are included the hypertensions of glomerulo - nephritis, pyelonephritis, renal anomalies, adrenocortical tumours, phæochromocytomata and coarctation of the aorta. Even in this group, the pathogenesis of only one (phæochromocytoma) is definitely known—that is, increased secretion of nor-adrenaline and adrenaline. The pathogenic relation of malignant hypertension to essential hypertension is controversial, although the former is probably a greatly accelerated and accentuated form of the latter. There appears to be a neurogenic, an endocrine and a renal factor in producing the increased tonus of the arteriolar smooth muscle of early essential hypertension. The neurogenic factor is considered to have its origin in nervous tension or cortico - hypothalamic imbalance, as a result of which the vasomotor system is periodically and later continuously set at a higher level of activity, resulting in increased systemic arteriolar vasoconstriction. The possibility that nervous tension may operate through endocrine changes rather than via the vasomotor system in essential hypertension has no direct evidence for its support. The possibility that an alteration in the functions of the anterior pituitary-adrenal cortex axis may be pathogenetic in essential hypertension has been entertained for many years, and the now well-documented importance of this axis in water and salt metabolisms has stimulated numerous studies of these metabolisms in essential hypertension. The possibility that changes in renal function may play a pathogenic role in essential hypertension has been suggested and denied for many years. The three principal hypotheses are alteration in the renin - angiotonin mechanism, decreased secretion of a renal blood pressure regulating hormone, and increased formation of pressor amines by the kidney. On the basis of evidence obtained chiefly during the past twenty years, the following working hypothesis for the pathogenesis of essential hypertension is proposed. Episodes of stress and cortico-hypothalamic imbalance activate a chain of patho-physiological events which at first is intermittent, but which eventually becomes continuous. An increased secretion of renin and other vasoactive substances results from renal hæmodynamic changes produced by increased neurogenic renal vasoconstriction and possibly from the increased innervation of long-postulated secretory nerve fibres to the tubule cells of the renal cortex. Simultaneously, there may be a decreased secretion of a renal blood pressure regulating hormone antagonistic to renin. In addition to exerting a pressor effect via angiotonin formation, renin stimulates the anterior pituitary lobe to produce an increased secretion of adrenocorticotropin and possibly somatotrophin, which stimulate the adrenal cortex to secrete more steroids, one of which has a pronounced pressor effect and minimal effects on carbohydrate and salt metabolisms. This steroid also acts on the kidney to increase the secretion of renin and other renal pressor substances. After a number of episodes of activation, this mechanism becomes self-sustaining as a result of an alteration in the metabolism of the renal tubule cells responsible for the secretion of renin and other vasoactive substances. There are other interactions which probably play a role in this complex mechanism. In addition to interrelations among the nervous system, the kidney, the endocrines and the musculature of the arterioles and the heart, this hypothesis postulates a potential basic metabolic difference between the renal tubule cells of persons with essential hypertension and normotensive persons, just as there is a poorly understood difference between the β cells of the islets of Langerhans of diabetic and non-diabetic persons. The hypothesis suggests that specific treatment may be devised to interrupt the proposed vicious circle at more than one point, and it regards essential hypertension as a single clinical entity, with opportunity for various degrees of functional and later anatomical change in different tissues, organs and systems. While the hypothesis is supported by studies on experimental hypertension, documentation by observations on essential hypertension is at present meagre.

Cancer of the Stomach and Heredity.

AAGE VIDEBÆK AND JOHANNES MOSBECH (*Acta med. scandinav.*, Vol. 149, Fasc. 2, 1954) found that cancer of the stomach occurred among the relatives of patients with this same disease much more commonly than among relatives of other patients. Their analysis suggests that there is a true inheritance of susceptibility to cancer in this particular site and not to cancer in general.

Essential Hyperlipæmia.

HAQVIN MALMROS *et alii* (*Acta med. scandinav.*, Vol. 149, Fasc. 2, 1954) state that increasing interest in the relation of serum lipides, and particularly cholesterol, to atherosclerosis has stimulated the investigation of patients with essential hyperlipæmia. They report the clinical features and laboratory findings in ten cases and stress the beneficial effects of treatment with a diet which is low in fat content.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held at the Royal Alexandra Hospital for Children, Camperdown, New South Wales, on June 17, 1954. The meeting took the form of a series of clinical demonstrations by members of the medical and surgical staffs of the hospital. Part of this report appeared in the issues of November 13 and 27, 1954.

Recto-Vaginal Fistula.

DR. E. S. STUCKEY presented two children who had been treated for recto-vaginal fistula. The first, a girl of eight years, had been born with a vaginal anus and had had a perineal operation to transplant it at the age of four years. She still had a recto-vaginal fistula as well as a reconstructed anus, with stenosis about one inch from the exterior and secondary megacolon. She had constant soiling *per vaginam* and *per anum* with constipated large motions daily. She had to have enemata. At operation, the fistula was repaired, and the rectum was mobilized and brought down to the perineum after removal of the narrowed portion. The levator sling was repaired and a perineal drainage tube inserted. The post-operative course was complicated by wound infection, and secondary suture was needed, but the anus did not become stenotic. On the patient's discharge from hospital, her condition was disappointing as she seemed to be quite incontinent. However, there was a good wide anus and no vaginal fistula. Subsequently, the patient learned to control the bowel action and was now seldom soiled.

The second child had had an imperforate anus with recto-vaginal fistula since birth. The bowels had worked fairly well through the fistula with a tendency to constipation and constant soiling. Moderate megacolon had developed. At operation, the fistula was repaired, and the rectum was transplanted to the anal region. The post-operative course was complicated by separation of mucosa from the skin and subsequent stenosis, requiring dilatation and later bilateral radial incision with implantation of skin flap on the right side. For some months after discharge from hospital the patient remained constantly soiled, as before operation; but subsequently spontaneous improvement occurred, and the child was now continent with normal bowel actions and a normal anal canal. The sphincter action was probably performed by voluntary action of the levator muscles.

Hirschsprung's Disease.

Dr. Stuckey then showed a child, aged twelve years, who had been treated for megacolon and had undergone bilateral sympathectomy at the Royal Alexandra Hospital for Children years previously. She required frequent enemata and constant laxatives. The abdomen was typical of moderate Hirschsprung's disease. X-ray examination suggested that the narrow segment was short, involving the anal canal and the lower half of the rectum only. Above that was gross megacolon. At operation, a transverse colostomy was performed with subsequent recto-sigmoidectomy. It was found that by mistake a high loop of sigmoid colon had been used for the colostomy, and it was necessary to undo this, to remove the whole lower loop to the anal canal and to bring down the anus to the proximal loop in one stage. The post-operative course was fairly uneventful, and the anus was easily dilated normally. The patient improved greatly, and now had three or four soft formed stools daily with full control. The pathologist could not say that the specimen was typical of Hirschsprung's disease. There was apparently a patchy absence of ganglion cells, greatest at the upper limit of the removed specimen. Moderate numbers of ganglion cells were present right down to the lower limit, which had included some squamous mucosa. Dr. Stuckey commented that the patient presented the problem of diagnosis of mild Hirschsprung's disease from so-called idiopathic megacolon. It was possible that in some cases of the latter disease the patient would be benefited by recto-sigmoidectomy. The girl under discussion was certainly very much improved, though it was uncertain whether she could be considered to have had true Hirschsprung's disease.

Another patient, a girl aged nine years, had suffered from constipation since birth. In 1947 she had been diagnosed as suffering from megacolon. Constant aperients and enemata were necessary to ensure regular bowel habits. No abnormality of the stools had been noted, nor had there been any marked abdominal distension. The child was very withdrawn in her manner and took no interest in her surroundings. She appeared either to be mentally backward or to have a severe personality defect. Examination of her abdomen revealed mild protuberance with a palpable mass in the left iliac fossa measuring three inches by three inches; this was mobile and could be indented. It was considered to be fæces. Rectal examination revealed that the anal sphincter tone was good. The rectum was voluminous and full of fæces. A report from the Child Guidance Clinic indicated that the child had a pre-schizoid type of personality and was at the lower level of normal intelligence. X-ray examination revealed the appearance of Hirschsprung's disease. Biopsy of rectal mucosa and submucosa showed no ganglion cells in Meissner's plexus. Subsequently, a one-stage recto-sigmoidectomy was performed. The resected portion of bowel extended from the midpoint of the sigmoid colon to one-half inch above the anal verge, and was greatly dilated. Microscopic examination showed that ganglion cells of the intramural plexuses were absent over the distal three inches of the specimen and present over the proximal 11 inches. The diagnosis was Hirschsprung's disease. Convalescence was satisfactory at first, but generalized abdominal tenderness and a raised temperature persisted, and one week after operation the child developed a recto-vaginal fistula. Rectal examination revealed the fistula at the level of the suture line in the anal canal anteriorly. The fistula admitted two fingers. Fæces were passed only *per vaginam* until a colostomy was performed, after which the vaginal discharge diminished. The colostomy then acted satisfactorily, and the child's general condition remained good, although her personality was unchanged.

Cooley's Anæmia.

DR. C. W. G. LEE presented a patient, aged two years and nine months, who was suffering from Cooley's anæmia. She had been admitted to hospital in February, 1954, with a history starting in January, 1953, when she had been admitted to hospital for examination for pallor, anorexia and irritability. She had been in and out of hospital on several occasions since and had received three blood transfusions prior to the present admission. The recent history was that the child had been discharged from hospital six weeks previously, but since had had increasing pallor, anorexia, irritability, fever and listlessness, with occasional episodes of vomiting. The urine was sometimes cloudy. Investigation of the family history revealed that the parents had been born in Cyprus. In the family, four previous children had died, two girls at the age of two years and two boys at the age of four years. The girls had become jaundiced at the age of five months and the boys at the age of seven months, and at the same time had developed anorexia, become thinner and developed terminal œdema. There was one sibling other than the present child, a six months old boy, who had developed anorexia but no blood changes. The father was one of 13 siblings, two having died in infancy. The mother's blood was of group A, Rh-positive. The result of a Wassermann test was positive, but that of a Kline test was negative. The father had a normal blood count with normal red blood cell fragility. The child was very pale, with a yellow tint of the skin but no jaundice. The spleen was firm and tender and could be felt five fingers' breadth below the left costal margin. The liver was firm and tender and could be felt two fingers' breadth below the right costal margin. A systolic murmur was audible over the precordium, of maximum intensity in the fourth left intercostal space. The pulmonary second sound was split. The hæmoglobin value was 6·81 grammes *per centum*, the erythrocyte count 3,680,000 per cubic millimetre, and the colour index 0·57. The mean corpuscular volume was 54 cubic microns, the mean corpuscular hæmoglobin concentration 30%. Of the erythrocytes 7% were reticulocytes. Nucleated red blood cells numbered 12,600 per cubic millimetre, and thrombocytes 73,600 per cubic millimetre. The leucocytes numbered 13,600 per cubic millimetre in approximately normal proportions. Treatment was commenced with cortisone, 25 milligrammes six-hourly, and three days later changed to 50 milligrammes eight-hourly. On March 1 the pallor was considerable, but the liver and spleen had decreased in size. The patient had continued at much the same level to the present date. X-ray examination revealed a well-marked, open, lacelike pattern in the long bones, metacarpals, ribs, scapulæ and pelvis, which the radiologist diagnosed as the result of blood dyscrasia. The appearance of the skull and facial bones was not typical of Cooley's anæmia, but changes in both radii, and to a lesser extent in the metacarpals, suggested Cooley's anæmia. The fragility test commenced at 0·4%, but was not complete at 0·28%.

Dermoid Cyst of the Spinal Cord.

DR. M. SOFER SCHREIBER showed a boy, aged eight years, who when admitted to hospital on March 11, 1954, had been

sick for ten days. He was feverish, his neck and back were stiff, his legs were flaccid below the knees, and his arms were patulous. In the mid-line of his back in the sacro-coccygeal region was a purple thickened patch of nævoid skin the size of a penny, from which hairs sprouted. There was no detectable sinus opening on to it. Lumbar puncture between the third and fourth lumbar spinous processes was unsuccessful. When it was repeated between the second and third spinous processes, one millilitre of pus was obtained (from which was grown *Bacillus proteus* on culture). The ventricular fluid contained 291 leucocytes per cubic millimetre, of which 128 were polymorphonuclear cells and 165 were mononuclear cells, and 80 milligrammes of protein per 100 millilitres. Laminectomy was performed at the level at which pus had been withdrawn. When the dura was opened, the cord and nerve roots were found welded together in an inflammatory mass. A provisional diagnosis of an inflamed tumour (? dermoid) or chronic meningitis was made, and chloramphenicol, sulphadiazine and streptomycin were administered. The neck and back stiffness disappeared, and some improvement occurred in the legs. Because of the risk of precipitating a *B. proteus* meningitis, further exploration of the cord was postponed. However, the paresis increased, and on April 18 a suprapubic cystotomy was required to relieve bladder distension. A further laminectomy was performed on May 5, and the inflamed cord was incised at the level of the second and third lumbar spinous processes. *B. proteus* pus was evacuated from a circumscribed abscess in the cord, into which streptomycin solution was instilled. On May 19 the nævoid patch of skin was excised. From the deep aspect a track led through the sacral hiatus into the sacral canal. There it became continuous with the dura. Inside the dura, filling the sacral canal, was a large dermoid cyst, full of sebaceous material and pus. At its upper end the cyst merged imperceptibly with the cord, there being no clear line of demarcation. The original abscess in the cord was separated by inflamed cord tissue from the dermoid cyst. The posterior wall of the dermoid was incised, and its contents were evacuated. The child now had paraplegia, with a flaccid left foot. Examination of the specimen confirmed that there was no sinus opening on to the surface of the nævoid skin.

The comment was made that spinal dermoids were much more common in children than in adults. Reviewing 23 intraspinal tumours diagnosed during the first year of life, Mosberg had found that six were lipomata and four were dermoids. In the latter group there was a high incidence of "pilonidal dimples" and telangiectasis with overgrowth of hair. The moral of the case under discussion must surely be that any such area in the mid-line of the back of an infant or child should be closely inspected, and should be excised and any intraspinal extension dealt with. Only thus could a tragedy like that in the present case be avoided.

Lipo-Meningocele with Sprengel's Shoulders and Dextrocardia.

Dr. Sofer Schreiber then showed a child, aged twenty-two months, who had a lipomatous mass overlying her sacrum. The question was whether it should be excised. Dr. Sofer Schreiber said that he thought that operation was indicated because: (i) similar masses previously explored had often had a deep stalk passing into the sacral canal and there connecting with intraspinal lipomata, both extradural and intradural, and (ii) the diagnosis might be at fault (a similar mass on exploration had been found to be a flexiform neuroma). The child also had Sprengel's shoulders, abnormalities of her cervical vertebræ and dextrocardia.

Craniostenosis, with Dorsal Accessory Urethra and Occipital Vascular Anomaly.

Dr. Sofer Schreiber's next patient was a boy who had been brought for consultation in February, 1954, at the age of two years, with the complaint of a pulsating swelling behind the right ear, which increased in size on coughing or crying. He was otherwise very well, and of normal development and intelligence. On examination he was found to have the following: (i) A soft pulsating swelling behind the right ear about three-quarters of an inch in diameter. Associated with this swelling were a thrill and a bruit, and also an underlying small defect in the occipital bone. (ii) A dorsal accessory urethra—a urethra-like sinus extending along the dorsum of the penis, having an opening behind the glans distally, and ending blindly behind the pubic base proximally. (iii) Bilateral papilœdema. (iv) A well-marked craniostenosis. All the sutures of the vault were fused, and there was a generalized increase in the convolutional markings. Arteriography was performed on February 17, 1954, but no abnormality was detected. Before the patient had left the operation table the occipital vascular anomaly had almost disappeared. It was now gradually reappearing. On February 24 a linear craniectomy was performed, the coronal and sagittal sutures being cut on the left side of the skull. He then remained well until about mid-May, since when he had been somewhat irritable. His papilœdema had disappeared when his fundi were examined in March. They now showed pallor of the disks and thinning of the vessels, suggesting optic atrophy. The artificial sutures were now well separated, and the brain was bulging through them, indicating the urgent need for further decompression by cutting sutures on the other side of the skull.

Dr. Sofer Schreiber commented that the case had a number of unusual features. The first was the craniostenosis. Onset at the age of two years with normal brain capacity must be very rare. When the patient was first seen at the age of two years his skull circumference (20 inches), developmental milestones and intelligence were all normal—despite fused sutures and evident signs of increased intracranial pressure (papilœdema and generalized convolutional markings). It therefore appeared that his craniostenosis must be of very recent origin. The second feature was the dorsal accessory urethra. That, though rare, was the commonest manifestation of double urethra. Fortunately the proximal end was blind, and thus there was no incontinence and no need for treatment. The third feature was the right occipital vascular anomaly. The exact nature of that remained undetermined. It appeared to be connected with the occipital artery. It was not known whether there was any intracranial extension.

Middle Meningeal Hæmorrhage with Pronounced Latent Period.

The next patient shown by Dr. Sofer Schreiber was a boy, aged seven years, who had been knocked over by a motorcycle on November 14, 1953. He became unconscious. Blood and cerebro-spinal fluid were leaking from his right nostril. X-ray examination of his skull revealed no fracture. He soon regained consciousness and remained well until six days later, when he became drowsy and developed weakness of the right side of the face, arm and leg, with increased deep reflexes and an upgoing right great toe. His left pupil was larger than the right. His fundi were normal. A left temporal burr-hole was made, and an extensive intracranial hæmatoma was evacuated. There was about a half-inch depth of old blood present. He subsequently made a rapid and complete recovery.

Dr. Sofer Schreiber's comment was that in the past (apart from infantile hæmorrhages) acute traumatic subdural hæmorrhages or hygromata had been more frequently seen in children than middle meningeal extradural hæmorrhages. However, in the last few months three patients with extradural hæmorrhages had been operated upon by the surgical staff of the Royal Alexandra Hospital for Children. The usual latent period in a middle meningeal hæmorrhage was only a few hours. In 33 cases of extradural hæmorrhage in which the patients had been operated upon by Rowbotham, whilst the usual latent period was about four hours, it varied from two hours to seven days. In McKenzie's 20 cases, ten of the patients had a classical short latent period of one to three hours, and ten had lucid intervals of from seven to twenty-one days. Rowbotham stated that the latent period could be accounted for by the ability of the brain to accommodate itself to a slowly expanding lesion for a long time before showing signs of compression. The rapid development of neurological signs later indicated loss of compensation in the brain rather than a further sudden severe hæmorrhage.

Meconium Ileus.

In presenting details of two cases of meconium ileus, Dr. Sofer Schreiber said that in this condition, which was associated with fibrocystic disease of the pancreas and widespread mucoviscoidosis, the meconium in the lower part of the intestinal tract of the newborn child produced intestinal obstruction because of its putty-like consistency. In the mid-ileum, the contents were rather fluid, but below there the meconium was very thick and exceedingly sticky, and adhered with great tenacity to the intestinal wall. This thick sticky meconium filled and obstructed a segment of variable extent in the lower part of the ileum. Commonly it blocked the last 10, 20 or even 30 centimetres of ileum. The meconium-filled and obstructed segment was dilated and thickened. Below it, the lower few inches of ileum and the ileo-caecal valve and colon were normal or subnormal in diameter, and contained very hard, dry, pellet-like nubbins of meconium concoctions. Not infrequently, in intrauterine life, an enlarged and distended loop of mid or lower ileum became twisted on itself, turned gangrenous and then adhered to surrounding structures. Occasionally a distended intestine would undergo perforation, either with or without

volvulus. Such perforations if occurring before birth gave rise to widespread sterile peritonitis, with the development of adhesions and generally a sealing-off of the perforation. Calcification developed in the reactive areas, and could be later identified in X-ray films of the abdomen. Clinically meconium ileus could sometimes be distinguished pre-operatively from other forms of intestinal obstruction in the newborn (i) by the palpation of intestinal concretions and (ii) by X-ray appearances—the inspissated meconium gave a mottled or granular appearance, and in some cases flecks of calcium might be seen indicative of burnt-out fœtal peritonitis.

The first case illustrated cure of the obstruction by the method of Mikulicz resection and double ileostomy. The baby had commenced vomiting on the second day of life, and her abdomen became distended. She passed a small amount of meconium. Plain X-ray examination of her abdomen suggested low ileal intestinal obstruction. At observation under local anæsthesia, a typical meconium ileus was found. A segment of the lower part of the ileum about 20 centimetres in length was distended with tarry, putty-like, exceedingly sticky meconium. The bowel above this obstructing segment was very dilated. Below it the terminal part of the ileum and ascending part of the colon were of small calibre and contained pellet-like nubbins of hard, dry meconium. A Mikulicz resection and double ileostomy were performed as advocated by Gross. The obstructing segment was exteriorized and resected. The proximal opening of the ileum was left open for decompression of the obstruction. A small catheter was inserted into the distal limb, and was subsequently used for irrigation and distension of the segment. A crushing clamp was applied to the spur on the fifth day, and an extraperitoneal closure was performed on the fourteenth day. No further trouble was experienced from the bowels, but chronic malnutrition and bronchitis developed, and the child died at the age of four months.

Dr. Sofer Schreiber commented that the method described of relieving the obstruction appeared to be a great advance on the method of Hiatt, who advocated the insertion of a catheter into the ileum and repeated lavage until the inspissated material had been washed away (an extremely difficult feat). Double ileostomy by the Mikulicz technique advocated by Gross was free from the ordinary objections to this procedure in the newborn child. Owing to the deficiency of enzymes in the intestinal fluids there was little or no erosion of the abdominal wall, and because of the viscidity of the intestinal secretions, fluid loss was minimal and easily overcome.

The second case illustrated the complications of antenatal volvulus, rupture and peritonitis. The baby concerned was noted to have a distended abdomen at birth, and commenced vomiting on the first day. No meconium was passed. At laparotomy that day, a long-standing peritonitis was found. The jejunum was greatly dilated and filled with greenish fluid and thick mucus. The jejunum ended abruptly at about its junction with the ileum. The proximal part of the separated ileum—for about six inches of its length—was twisted on itself in a local volvulus, and was completely gangrenous (evidently an old gangrene, for the gut was brown and soft). The remainder of the ileum distal to the local volvulus was packed with hard inspissated meconium. Numerous old peritoneal adhesions were observed. Evidently because of the meconium, ileus and antenatal volvulus had occurred, rupture of the gut had taken place above the volvulus, and the ends had become sealed off and separated.

(To be continued.)

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

FEROCITY OF THE BENEVOLENT.[1]

[From the *Australian Medical Journal*, September 1, 1846.]

HAVING determined the question whether we should notice in any manner the bickerings of some of the Sydney Practitioners on the occasion of a recent election of a Physician to the Benevolent Asylum: another question was suggested—namely, how should we approach the loathsome subject. The ignorance and prejudices of the faculty merit ridicule and castigation: but we consider the language of sober judgement better suited to the interests of the profession and to those of the indigent sick.

It appears then that in the course of this proceeding, which we must remember was of a popular nature, a suspicion was excited of unfair influence of the Medical Gentlemen of the Asylum and to the prejudice of one of the candidates for the vacant office: and that in the exercise of his privilege one of the Committee of Management declared to the meeting that he entertained that suspicion. In this manner arose horrida bella—which led to the premature dissolution of the meeting and the postponement of the business for which they had assembled.

This unlucky interruption was used by the contending parties to write down each other and by means so contemptible as to excite general indignation and disgust. One individual who really had nothing to do with it, was dragged into the mêlée because of a quarrel which he had had with another: and because he had entertained at his table one of the gentlemen who sought the vacant office. Now, although the usages of the world are against us, we consider that persons are disqualified to take charge of the indigent, who in their conduct deny, the laws of God and man. But it does not appear that the parties objected to were charged with any such offenses: we are left to guess in what manner the candidate alluded to might have been contaminated or rendered unfit to administer to the infirm, and we arrive at the conclusion that bitter animosity on personal grounds was the motive of the hostility shewn to the host and his guest, while the welfare of the indigent was made a secondary object.

. . . . . .

Many of the evils we now deplore, as arising out of this and similar transactions proceed from the participation of the multitude in business of which they are incompetent judges. Besides the passions, by which tradesmen and ambitious persons are led to interfere in such manners, ignorance allows to the pretensions of the forward the same or greater consideration than to solid merit and the competitor who confounds the praise of goodness with the practice of it—who descants on charity and benevolence and humanity, is most likely to meet with the favour of the multitude. The medical man seeks admission into these institutions as a means of getting profitable employment: his abilities are investigated by people who cannot appreciate them: the shoemaker and tailor patronise the candidate who is most likely to deal with them and the proper object of these elections is lost sight of—common sense is insulted and we want only the amicable old friend of the Vicar of Wakefield to stamp these proceedings with their true character.

[1] From the original in the Mitchell Library, Sydney.

Hospitals.

CARCINOMA CERVICIS UTERI, 1930-1953: FIVE-YEAR AND TEN-YEAR CURE AND SURVIVAL RATES, COMPILED DECEMBER 31, 1953.

KING GEORGE V MEMORIAL HOSPITAL, ROYAL PRINCE ALFRED HOSPITAL, SYDNEY.

FROM the year 1930 the majority of the members of the staff of the Royal Prince Alfred Hospital have followed the combined treatment of cancer of the cervix uteri—that is, one application of radium (100 milligramme-hours) followed by Wertheim's radical hysterectomy when possible. Those patients considered unfit for operation are treated by a continuation of radiotherapy.

Since 1930 the five-year and ten-year results have become better and better. The operative mortality over the whole period from 1930 to 1953 was 20 deaths in 584 Wertheim's hysterectomies (3·4%). The immediate and late post-operative complications were reduced to a minimum.

The last five-year results (1948—Tables IVA and IVB) are the best yet attained. Undoubtedly they are due to the greater availability of blood transfusion made possible by the Red Cross Blood Bank, the introduction of antibiotics for intervening infections, the better pre-operative and post-operative care, and, above all, the improved operative technique of the staff, who are now treating surgically some patients in the late third stage. The operability rate over all patients examined during the past five years was 61·8%,

TABLE I.

Royal Prince Alfred Hospital, Sydney: Carcinoma Cervicis Uteri, 1930–1948: Five-Year and Ten-Year Cure and Survival Rates, Compiled December, 1953.

Observation.	Five Years.	Ten Years.
All patients examined with view to treatment	751	498
All patients treated	710	477
Alive without recurrence	252	130
Alive with recurrence	11	2
Dead of carcinoma	423	320
Dead of intercurrent disease (under five and ten years)	16	19
Lost or not followed up	8	6
Cure rate amongst all patients examined	33·5%	26·1%
Survival rate amongst all patients examined	35·0%	26·5%
Cure rate amongst all patients treated	35·5%	27·25%
Survival rate amongst all patients treated	37·0%	27·7%

If the first line of attack against this disease, the general practitioner (who unfortunately examines only a few patients each year), was stimulated to recognize or suspect cancer in its early stages, it would not be too sanguine to expect 85% to 90% five-year cures, and what other disease could offer a better expectation of living?

We admit that the organization of cancer detection clinics as recently portrayed by Dr. Brewster Miller from the United States of America is a help in the fight against cancer; but the education of the public, although important, is only secondary to the education of the general practitioner, who is the one person who can better the results obtained by the known methods of treatment.

It should be made clear that cancer treatment, especially that of the internal organs, is a subject for specially trained men and women, and that most countries believe that such teams should be concentrated in special centres in capital cities.

TABLE IIA.

Royal Prince Alfred Hospital, Sydney: Carcinoma of Cervix: Five-Year Survival Rates of All Patients Examined, 1930 to 1948 Inclusive.

Treatment.	Stage 0.		Stage I.		Stage II.		Stage III.		Stage IV.		Total.	
	Number.	Alive.	Number.	Alive.	Number.	Alive.	Number.	Alive.	Number.	Alive.	Number.	Alive.
Application of radium and surgery.	12	10	46	35	173	98	117	57	0	0	348	200 (58·0%)
Application of radium alone	—	—	6	3	55	17	192	33	88	6	341	59 (17·3%)
Application of radium and incomplete surgery.	—	—	1	1	6	2	10	1	3	0	20	4 (20·0%)
No treatment	—	—	—	—	—	—	2	—	40	—	42	—
Total	12	10	53	39	234	117	321	91	131	6	751	263 (35·0%)

TABLE IIB.

Royal Prince Alfred Hospital, Sydney: Carcinoma of Cervix: Ten-Year Survival Rates of All Patients Examined, 1930 to 1948 Inclusive.

Treatment.	Stage 0.		Stage I.		Stage II.		Stage III.		Stage IV.		Total.	
	Number.	Alive.	Number.	Alive.	Number.	Alive.	Number.	Alive.	Number.	Alive.	Number.	Alive.
Application of radium and surgery.	7	6	29	15	99	47	96	40	—	—	231	108 (46·7%)
Application of radium alone	—	—	3	1	31	7	133	13	70	3	237	24 (10·1%)
Application of radium and incomplete surgery.	—	—	—	—	—	—	6	—	2	—	8	—
No treatment	—	—	—	—	—	—	1	—	21	—	22	—
Total	7	6	32	16	130	54	236	53	93	3	498	132 (26·5%)

TABLE III.

Survival Rate Excluding Stage IV and Deaths from Intercurrent Disease, 1930 to 1948 Inclusive.

Treatment.	Stage IV Excluded.		Stage IV and Intercurrent Disease Deaths Both Excluded.	
	Five Years.	Ten Years.	Five Years.	Ten Years.
(a) Application of radium and surgery	58·0%	46·7%	59·2%	49·3%
(b) Application of radium alone	20·9%	12·6%	21·5%	13·1%
(c) Average of (a) and (b)	42·1%	32·4%	44·0%	34·0%

and the immediate operative death rate was 0·8% (236 Wertheim's hysterectomies with two deaths).

All realize that if women in Stages 0, I, II and early III presented themselves more frequently, the overall results would be still better.

TABLE IVA.

Royal Prince Alfred Hospital, Sydney: Survival Rates of Carcinoma Cervicis Uteri for the Year 1948.

Observation.	Five Years.	Ten Years.
All patients examined with view to treatment	61	—
All patients treated	59	—
Alive without recurrence	30	—
Alive with recurrence	—	—
Dead of carcinoma	26	—
Dead of intercurrent disease (under five and ten years)	1	—
Lost or not followed up	2	—
Cure rate amongst all patients examined	49·1%	—
Survival rate amongst all patients examined	49·1%	—
Cure rate amongst all patients treated	50·8%	—
Survival rate amongst all patients treated	50·8%	—

Again, if the evaluation of the results of different known methods of treatment is to be accomplished, certain principles in recording results must be adhered to by all centres of treatment.

TABLE IVB.

Royal Prince Alfred Hospital, Sydney: Carcinoma of Cervix for the Year 1948, Compiled December, 1953. Five Years' Survival.

Treatment.	Stage 0.		Stage I.		Stage II.		Stage III.		Stage IV.		Total.	
	Number.	Alive.	Number.	Alive.	Number.	Alive.	Number.	Alive.	Number.	Alive.	Number.	Alive.
Application of radium and surgery.	3	2	7	7	28	17	2	2	—	—	40	28 (70·0%)
Application of radium alone	—	—	—	—	5	1	10	0	3	—	18	1 (5·5%)
Application of radium and incomplete surgery.	—	—	—	—	—	—	1	1	—	—	1	1
No treatment	—	—	—	—	—	—	—	—	2	—	2	—
Total	3	2	7	7	33	18	13	3	5	—	61	30 (49·1%)

All patients examined as well as those submitted to treatment must be recorded. All patients must have had a biopsy specimen examined. All patients lost in the follow-up must be regarded as dead. All deaths from intercurrent disease must be stated, and when cure and survival rates for five and ten years are being recorded, all patients must be examined and declared free of lumps or any other symptom or sign of the disease. More especially no case diagnosed as Stage 0 should be recorded unless the biopsy has been declared by a competent pathologist to show a frank cancer.

Any comparison of the results of the different types of treatment, to be of value, should be recorded by each centre of treatment in a uniform manner.

For a sparsely populated country like Australia the Bourne and Williams method of recording results is easily interpreted by the busiest practitioner and should be adopted by all centres. Those specialists who may desire a more detailed dissection should refer their results to Dr. J. Hayman, Radiumhemmet, Stockholm 60, Sweden, who now compiles world statistics from 72 countries.

As a staff, we are firmly of the opinion that all patients with suspected uterine cancer should be sent forthwith to an established centre, and that it is waste of time and against the interest of the patient to send the specialist team to peripheral or country areas. The patient to the centre, rather than the centre to the patient, should be the policy if good results are to be attained.

Table VI gives the overall statistics for cancer of the *corpus uteri*.

The members of the staff gratefully acknowledge the work of Dr. Frank Piggot in compiling these statistics for publication.

Signed on behalf of the gynæcological staff of the King George V Memorial Hospital, Royal Prince Alfred Hospital:

H. H. SCHLINK.

TABLE V.

Survival Rate, Stage IV and Deaths from Intercurrent Disease Both Excluded: Year 1948.

Treatment.	Stage IV Excluded.		Stage IV and Intercurrent Disease Deaths Both Excluded.	
	Five Years.	Ten Years.	Five Years.	Ten Years.
(a) Application of radium and surgery	70·0%	—	70·0%	—
(b) Application of radium alone	6·6%	—	7·1%	—
(c) Average of (a) and (b)	52·7%	—	53·7%	—

TABLE VI.

Royal Prince Alfred Hospital, Sydney: Survival Rates of Carcinoma Corporis Uteri, 1930 to 1948.

Treatment.	Number of Cases.	Alive.	Deaths.		Lost.	Survival. (*Per Centum.*)
			Post-operative.	Other.		
Five-Year Survival.						
Application of radium and surgery, or surgery alone	117	83	2	28	4	70·9
Application of radium alone	28	4	2	21	1	14·3
Application of radium and incomplete surgery	4	1	1	2	—	—
Incomplete surgery alone	4	2	1	—	1	—
No treatment	7	—	—	7	—	—
Total	160	90	6	58	6	56·2
Ten-Year Survival.						
Application of radium and surgery, or surgery alone	65	37	2	22	4	56·9
Application of radium alone	16	1	1	14	—	—
Application of radium and incomplete surgery	3	—	1	2	—	—
Incomplete surgery alone	1	—	1	—	—	—
No treatment	2	—	—	2	—	—
Total	87	38	5	40	4	43·6

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 65, of November 4, 1954.

NAVAL FORCES OF THE COMMONWEALTH.

Permanent Naval Forces of the Commonwealth (Sea-Going Forces).

Transfer to the Emergency List.—Surgeon Captain Henry Woodall Gault is transferred to the Emergency List and reappointed for temporary service, dated 2nd November, 1954.

AUSTRALIAN MILITARY FORCES.

Citizen Military Forces.

Northern Command: First Military District.

Royal Australian Army Medical Corps (Medical).—1/55673 Honorary Captain G. F. Dixon is appointed from the Reserve of Officers, and to be Captain (provisionally), 9th August, 1954.

Southern Command: Third Military District.

Royal Australian Army Medical Corps (Medical).—2/101827 Captain (provisionally) J. S. Crosbie relinquishes the provisional rank of Captain and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (3rd Military District) in the honorary rank of Captain, 12th May, 1954.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps.

2nd Military District.—To be Honorary Captain, 20th September, 1954: Charles Edmund Graham.

The notifications respecting the following officers which appeared in Executive Minute No. 148 of 1954, promulgated in *Commonwealth Gazette*, No. 51, of 1954, are withdrawn: Lieutenant-Colonels S. C. M. Hiatt and K. C. T. Rawle, E.D., and Captain L. C. Jabour.

5th Military District.—The resignation of Captain I. O. Thorburn of his commission is accepted, 31st July, 1954.

6th Military District.—To be Honorary Captain, 20th September, 1954: Laurence Maurice Jacks.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

General Revision Course, 1955.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that the twenty-sixth annual general revision course will now be held for two weeks from May 16 to 27, 1955. The main theme of the course will be cardio-vascular diseases, and in addition the programme will, as in former years, be a comprehensive survey of modern trends in diagnosis and treatment of special value to general practitioners. Included in the programme will be special demonstrations, seminars and conferences on new drugs and therapeutic measures, radiographic and electrocardiographic conferences, gynæcology, obstetrics, neurology, psychiatry and pædiatrics.

Social activities will include a golf competition for the Post-Graduate Golf Cup and the Brydon Cup (for country competitors), a cocktail party and a theatre party.

The Eighth Annual Post-Graduate Oration will be given by Dr. V. M. Coppleson on "George Bennett, 1804-1892, the Greatest of Australia's Physician-Naturalists" on Wednesday, May 18, at 8 p.m., in the Great Hall of the University of Sydney.

Deductions from income tax may be claimed for fees and travelling expenses by medical practitioners who are in practice. When such deductions are claimed, "Taxation File No. AF/1865" should be quoted.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED NOVEMBER 6, 1954.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	9(7)	2(2)	2	..	3(1)	..	..	..	16
Amœbiasis	..	..	..	..	1(1)	..	..	..	1
Ancylostomiasis	..	..	..	..	..	..	..	..	..
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	..	..	..	..	1	..	..	..	1
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	2	7(4)	14(8)	..	..	..	..	..	23
Diphtheria	8(6)	1(1)	2(1)	..	..	..	..	..	11
Dysentery (Bacillary)	..	..	6(5)	..	..	..	..	..	6
Encephalitis	..	1	..	..	..	..	..	..	1
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	1	..	..	1
Infective Hepatitis	91(51)	51(37)	..	..	2(1)	..	..	8	152
Lead Poisoning	..	14(14)	6	..	..	..	..	..	20
Leprosy	..	..	..	..	..	..	1	..	1
Leptospirosis	..	..	4	..	..	..	..	..	4
Malaria	..	..	1(1)	..	..	..	1	..	2
Meningococcal Infection	3(1)	..	1(1)	1	..	..	..	..	5
Ophthalmia	..	..	..	..	2	..	..	..	2
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	2(1)	11(3)	..	7(4)	2(1)	..	..	..	22
Puerperal Fever	1	..	..	..	..	..	..	..	1
Rubella	..	24(20)	..	..	27(21)	..	..	..	51
Salmonella Infection	..	..	..	..	1(1)	..	..	..	1
Scarlet Fever	17(16)	23(14)	3(2)	4(3)	..	..	..	..	47
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	..	..	..	..	..	..	..
Trachoma	..	..	..	..	6	..	..	..	6
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	15(12)	16(8)	20(6)	15(13)	8(7)	4	2	..	80
Typhoid Fever	1(1)	..	..	..	..	..	..	..	1
Typhus (Flea-, Mite- and Tick-borne)	..	..	..	..	1	..	..	..	1
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

Fees for attendance at the course are £12 12s. full time or £6 6s. part time or one week only. Written application should be made to the Course Secretary of The Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney. Telephones: BU 5238, BW 7483. Telegraphic address: Postgrad, Sydney.

MELBOURNE MEDICAL POST-GRADUATE COMMITTEE.

Course in Surgery.

OWING to unforeseen circumstances, the post-graduate course in surgery to be conducted by the staff of the Royal Melbourne Hospital, previously announced to take place from the first week in March, will not now commence until March 21, 1955.

The arrangements for this course are now as follows. A course in surgery will be conducted by the staff of the Royal Melbourne Hospital from March 21 until April 29, 1955. Classes in clinical surgery will be held on Monday, Tuesday, Thursday and Friday afternoons at 4 p.m. Permission will be obtained for all members of the classes to have access to the operating theatres and general surgical work of the hospital. The fee for the course will be £5 5s.; this will be used to defray expenses of patients brought to the hospital for demonstration purposes. The greater part of the time of the course will be devoted to clinical surgery.

Enrolments should be made through the Melbourne Medical Post-Graduate Committee, 394 Albert Street, East Melbourne.

FELLOWSHIPS AT THE ROYAL MELBOURNE HOSPITAL.

THE Committee of Management of The Royal Melbourne Hospital has recently approved of the establishment of Fellowships in medicine and surgery and in special departments of the hospital for graduates wishing to undertake further courses of study. Conditions of the Fellowships are as follows:

1. Those applying for a Fellowship must possess academic qualifications which will be accepted as a token of their serious intention to pursue some specific branch of study.

2. Fellowships would be available to interstate or international graduates, in preference to local graduates.

3. Appointees should be committed full time to their Fellowship, which should be for a minimum period of six months.

4. Fellows would be attached to the hospital for study only. Their duties should not overlap any of the duties of established medical offices or duties in the hospital; they would be responsible to the head of a unit or department, and through him to the Committee of Management of The Royal Melbourne Hospital.

5. The stipend would not be the direct responsibility of the Committee of Management of The Royal Melbourne Hospital.

6. Fellows may be resident in the hospital when accommodation becomes available.

7. A Fellowship should be for a minimum period of six months, renewable if recommended, but subject to review at the end of twelve months.

Further details will be made available to interested persons on application to the Manager, Post Office, The Royal Melbourne Hospital, Victoria.

Notice.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS IN AUSTRALIA (NEW SOUTH WALES DIVISION).

Laennec Society.

A CLINICAL MEETING of the Laennec Society will be held at Sydney Hospital in the Maitland Lecture Theatre on Monday, December 6, 1954, at 8 p.m. Members are invited to bring any guests who may be interested.

Medical Appointments.

Dr. J. V. Gordon has been appointed honorary neurophysician at the Royal Adelaide Hospital.

Deaths.

THE following deaths have been announced:

STEVEN.—Walter Edward Steven, on October 17, 1954, at Adelaide.

HUSSEY.—Percival Francis Leitch Hussey, on November 11, 1954, at Adelaide.

DERAVIN.—Ernest Alfred Deravin, on September 6, 1954, at East St. Kilda, Victoria.

Diary for the Month.

DEC. 6.—Victorian Branch, B.M.A.: Executive of Branch Council.
DEC. 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.
DEC. 8.—Victorian Branch, B.M.A.: Branch Council Meeting.
DEC. 9.—New South Wales Branch, B.M.A.: Branch Meeting.
DEC. 14.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all contract practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Tasmania: Part-time specialist appointments for the north-west coast of Tasmania.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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